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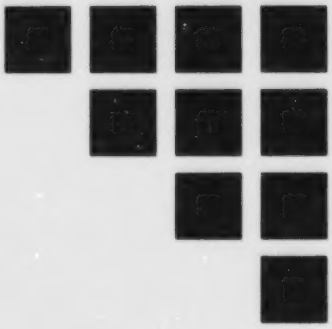


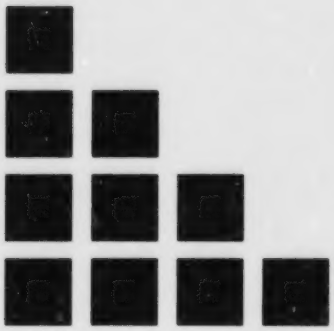
A Dynamic Analysis of the School-to-Work Transition of Post-Secondary Graduates in Canada

R-99-14E

by
Ross Finnie

July 1999

Research Paper



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Abstract

This paper reports the results of a multi-dimensional empirical analysis of the school-to-work transition of post-secondary graduates in Canada based on three waves of the National Graduates Surveys, representing those who successfully completed their programs at Canadian colleges and universities in 1982, 1986, and 1990. Information was gathered during interviews conducted two and five years after graduation for each group, with this longitudinal aspect of the data permitting the tracking of the evolution of outcomes in the years following graduation. The analysis is broken down by gender and specific level of education (college, bachelor's, master's, Ph.D.

The findings indicate, first of all, that post-secondary graduates have generally been doing quite well as a group, with most individuals finding employment, holding jobs that are relatively attractive and that are related to their schooling, enjoying reasonably high earnings levels, and so on.

Second, the school-to-work transition is clearly a *process*, rather than an "event," with most outcomes changing significantly – and mostly for the better – from two to five years following graduation. Most of the initially unemployed find jobs; the proportion of workers in temporary jobs declines precipitously; mean earnings rise substantially; and so on. Any assessment of "how graduates are doing" should, therefore, be seen in this dynamic context.

Third, the school-to-work transition did not generally change a great deal across cohorts. For example, unemployment rates were uniformly about the same for the first and last cohorts; those graduates who were unemployed as of the first interview subsequently found jobs at about the same (high) rates; the nature of the jobs held (as measured along a variety of dimensions) remained relatively stable; and so on. Some changes have, however, occurred, including small to moderate drops in male graduates' earnings (while those of females have risen), along with some other changes in the nature of the jobs held and the transition towards regular employment situations.

Résumé

L'article présente les résultats d'une analyse empirique multidimensionnelle de la transition vers le marché du travail de diplômés de programmes postsecondaires au Canada. L'analyse porte sur trois Enquêtes nationales auprès des diplômés, c'est-à-dire des étudiants qui ont terminé avec succès un programme d'études universitaire ou collégial canadien en 1982, 1986 et 1990. Les renseignements ont été recueillis dans le cadre d'entrevues effectuées deux et cinq ans après que chacun de ces groupes d'étudiants aient obtenu leur diplôme. Cette dimension longitudinale des données permet un suivi de l'évolution de la situation des étudiants dans les années qui suivent l'obtention de leur diplôme. L'analyse est ventilée selon le sexe et le niveau d'études (collège, baccalauréat, maîtrise ou doctorat).

Les résultats de l'analyse indiquent d'abord que la situation des diplômés du niveau postsecondaire est très intéressante, que la plupart se trouvent et conservent un emploi intéressant, lié à leur domaine d'études, et touchent un salaire relativement élevé, etc.

En second lieu, on peut dire que la transition de l'école vers le travail est un processus, plutôt qu'un «dénouement», dont la plupart des issues changent de façon appréciable, généralement pour le mieux, de deux à cinq ans après l'obtention du diplôme. La plupart des diplômés qui sont d'abord en chômage se trouvent un emploi; le pourcentage de ceux qui obtiennent un emploi temporaire diminue abruptement; la moyenne des revenus augmente de façon appréciable; etc. Toute évaluation de la «situation des diplômés» doit donc s'inscrire dans ce contexte dynamique.

En troisième lieu, la transition de l'école vers le travail n'est pas très différente d'une cohorte à l'autre. Ainsi, les taux de chômage sont assez semblables pour la première et la dernière cohorte. Le pourcentage des diplômés qui étaient sans emploi au moment de la première entrevue et qui se sont trouvés un emploi par la suite est à peu près le même (élevé); la nature des emplois (mesurée en tenant compte d'une gamme de dimensions) est demeurée à peu près la même; etc. Certains changements se sont néanmoins produits, y compris de légères diminutions dans le revenu des hommes (alors que le revenu des femmes a augmenté), dans la nature des emplois et dans la transition vers des emplois permanents.

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Table of Contents

1. Introduction 1

2. The Data and the Analytical Framework 4

2.1 The NGS Data and the Construction of the Working Samples 4

2.1.1 The National Graduates Surveys 4

2.1.2 Selection of the Working Samples 5

2.2 The Analytical Framework and the Variables used in the Analysis 7

2.2.1 The Analytical Framework and Reporting Rules 7

2.2.2 The Variables Included in the Analysis 9

3. Empirical Findings 12

3.1 Sample Sizes and the Distribution of Graduates by Sex, Level and Field 12

3.1.1 Sample Sizes and the Underlying Populations of Graduates 12

3.1.2 The Distribution of Graduates by Degree Level 13

3.1.3 The Distribution of Graduates by Sex 14

3.1.4 The Distribution of Graduates by Discipline 15

3.2 Further Studies 18

3.2.1 New Diplomas 18

3.2.2 Diploma Dynamics 21

3.2.3 Post-Graduation Combinations of Work and Study 23

3.3 Employment, Unemployment and Part-Time Employment Rates 23

3.3.1 Unemployment 23

3.3.2 Part-time Employment 26

3.3.3 Employment Status Dynamics at the Individual Level 28

3.4 Job Characteristics 32

3.4.1 Temporary Employment: Levels, Dynamics, and Cross-Cohort Changes 32

3.4.2 Self-Employment 37

3.4.3 Multiple Jobs 42

3.5 The Job-Education Skill Match 45

3.5.1 The Skill-Use Index 45

3.5.2 Educational Pre-Requisites and Graduates' Qualifications 47

3.6 Earnings 53

3.6.1 Earnings Levels 53

3.6.2 Earnings Patterns and Composition Effects 57

3.6.3 Earnings Dynamics at the Individual Level 58

3.7 Overall Satisfaction with the Job and Educational Program 62

3.7.1 Job Satisfaction 62

3.7.2 Overall Evaluation of the Educational Program 65

3.8 Job and Geographical Mobility 67
3.8.1 Change of (Main) Employer 67
3.8.2 Inter-Provincial Migration 69

4. Conclusion 74
4.1 Summary of the Principal Findings 74
4.2 Implications and Caveats 76
4.3 Avenues for Further Research 78

Appendix A: Variables Used in the Analysis 79

Appendix B: Post-Graduation Patterns of Work and Study 86

References 95

1. Introduction

Graduating from college or university and moving into the labour force is an important transition, yet our understanding of it is still quite limited.[1] What are the employment rates in the years following graduation? What kind of jobs are being found – part-time or full-time, temporary or permanent – and what sort of movement is there across these different types of jobs? How do earnings levels evolve over the early years in the labour market? What is the level of job satisfaction – soon after graduation and a few years later? To what extent do graduates use the skills they have learned at school, and how do their qualifications line up against the prerequisites of their jobs? What is the extent of job turnover in the early years following graduation? How mobile are graduates across provincial boundaries? How do graduates evaluate their programs of study?

The contribution of the present paper to our understanding of such issues is to report the results of an empirical analysis of the school-to-work transition of Canadian post-secondary graduates based on three waves of the National Graduates Surveys, which comprise large, representative samples of individuals who successfully completed their programs at Canadian colleges or universities in 1982, 1986, and 1990, with information gathered during interviews conducted two and five years after graduation for each group of graduates (1984/87, 1988/91, 1992/95).[2]

The NGS databases are well suited to such an undertaking, with their size and representative structure, the selection of interesting variables available, the longitudinal nature of the information, and the availability of three cohorts of data providing the opportunity for a rather uniquely extensive and detailed view of the school-to-work transition of Canadian post-

[1] See Krahn [1996] for a review of the existing evidence in the Canadian context, and OECD [1996] for an international perspective.

[2] This is one of a series of related papers by the author based on the NGS data: Finnie [1999a] focuses on the employment and earnings patterns of graduates, Finnie [1999b] analyses the changes in the structure of graduates' earnings across cohorts using a regression based decomposition approach, and Finnie [1999c, d] look at Bachelor's graduates' outcomes by field of study. In other joint work, Betts, Ferrall and Finnie [1998] use a hazard model framework to look at the time to the first job, while Betts, Ferrall and Finnie [1999] analyse the effects of the quality of post-secondary institutions on earnings; Burbidge and Finnie [1999] investigate inter-provincial mobility at the baccalaureate level; Finnie and Garneau [1996] and Schwartz and Finnie [1996] analyse student borrowing; Finnie and Wannell [1999] and Abbott, Finnie and Wannell [1999] focus on gender comparisons; and Lavoie and Finnie [1999] analyse outcomes for science and technology graduates, while Lavoie and Finnie [1998a, b, c] investigate the record for engineering graduates and their role in the accumulation of technology.

secondary graduates in the 1980s and 1990s, a period generally thought to have been one of significant labour market changes, especially for younger workers.[3]

The analysis is multi-dimensional, covering the following outcomes: the distribution of graduates by level and sex, further education, employment rates, job status (part versus full-time, temporary versus permanent, self-employment, multiple jobs), the job-education skill match and credentials match, earnings, and employment and geographical mobility. The entire study covers graduates at the college level and all three university levels (Bachelor's, Master's, and Ph.D.), and outcomes are broken down by sex, thus providing for gender comparisons throughout.

The results of this paper should be of interest to a variety of readerships. First, those interested in labour markets should find the results of interest for the dynamic picture they provide of early career outcomes and the relationship of these outcomes to individuals' schooling backgrounds. Second, policy makers in the area of human resources should find the results pertinent to any assessment of the need to intervene at this important point in individuals' careers and to determine the preferred nature of any such required interventions. Third, education policy makers, as well as university administrators themselves, should find the analysis relevant to a variety of issues, such as the degree to which post-secondary graduates are being prepared for the labour market and how they assess their programs from the vantage point of having been out several years, how much students might be expected to pay for the costs of their post-secondary educations, and so on. Finally, graduates who have been through the transition might be interested in comparing their own experiences to those of others, while current and future students should be able to make more informed choices by knowing better what to expect in the post-graduation years.

The next section of the paper describes the National Graduates Surveys databases, the construction of the working samples, the analytical framework, and the variables included in the analysis. This is followed by the presentation of the empirical results, which make up the bulk of

[3] Beaudry and Green [1997], Beach and Slotsve [1996], Finnie [1997a], Morissette and Bérubé [1996], Morissette, Myles, and Picot [1995], Picot [1997], Riddell [1995], and Zyblock [1996] all report that the earnings levels of younger workers have been declining in relative and/or absolute terms; while Beaudry and Green, Morissette and Bérubé, and a series of papers by Finnie [1997b, c, d] indicate that younger workers' movements up the earnings ladder over the early years in the labour market have also slowed.

the paper. The final section includes a summary of the major findings, discusses some of the broad implications of the results, and offers some suggestions for further research.

The major conclusions may be summarized as follows:

- The news is generally rather "good", in that most college and university graduates have been finding employment, their jobs appear to have generally been of a relatively attractive nature and related to their schooling, earnings levels have been reasonably high.
- The longitudinal aspect of the analysis reveals that outcomes have tended to improve substantially over the early years in the labour market: the school-to-work transition seems, therefore to be more of a *process* than an "event" which involves graduates moving from part-time and temporary jobs into full-time and permanent positions, experiencing significant increases in earnings.
- Despite all the talk of how labour markets have changed over the last decade and how young workers have been particularly smitten by these changes, the situation appears to have been greatly exaggerated in the case of post-secondary graduates. The data show no evidence of any widespread deterioration in post-graduation outcomes for the most recent cohort of graduates relative to the earlier ones, and most elements of the school-to-work transition have not changed very much. That said, certain smallish changes have occurred, especially as of the second interview dates, such as small to moderate declines in the real earnings levels of certain groups of male (but not female) graduates, fewer movements from temporary jobs to permanent positions, more job turnover.

2. The Data and the Analytical Framework

The first part of this section describes the general characteristics of the National Graduates Surveys and the selection of the working samples. In the second part, the analytical framework is explained and the variables used in the analysis are listed and defined.

2.1 The NGS Data and the Construction of the Working Samples

2.1.1 The National Graduates Surveys

The National Graduates Surveys (and Follow-Up) databases, developed by Statistics Canada in partnership with Human Resources Development Canada, are well suited to this analysis for a number of reasons. First, the NGS files are quite large, with over 30,000 individuals in each survey, thereby facilitating the sort of detailed analysis of the post-graduation experience that no general survey database (such as the Survey of Consumer Finances, General Social Survey, and Survey of Labour Income Dynamics) could ever provide, while the representative nature of the databases allows us to generalise the results to the population of graduates at large.[4]

Second, and again stemming from the particular focus of the NGS databases, the files include an interesting array of variables covering the educational experiences, general labour market outcomes, specific job characteristics, and other outcomes. These include not only more conventional measures, such as employment status and earnings levels, but also others more specifically related to the particular experiences of recent post-secondary graduates going through the school-to-work transition, such as the extent to which the skills learned at school are being used in the job, evaluations of the current job and the education program from which the individual graduated, and so forth, thus allowing for an extensive and multi-dimensional analysis of this important career stage.

[4] The NGS databases are based on a stratified sampling scheme (by province, level of education, and field of study), with all results reported below reflecting the appropriate sample weights. The sampling framework of the NGS databases is established through the use of institutions' administration files on graduates, with those records also providing some of the basic educational information on the NGS files, such as program and discipline of study. The databases also include trade and vocational school graduates, but these individuals are not included in the present analysis.

Third, the longitudinal element of the surveys, deriving from the two interviews conducted for each cohort two and five years following graduation, facilitates a tracking of the school-to-work transition and early years in the labour market, with the resulting perspective precisely situated as of the two specific points in time relative to graduation corresponding to the interview dates, while covering a relatively extended period of time – the first five years after leaving school. This provides for an analysis which is dynamic not only in aggregate terms (*e.g.*, the evolution of employment rates, mean earnings levels, and so on), but also at the individual level, such as allowing us to see how many individuals move from unemployment to employment and *vice versa* from two to five years following graduation, to observe changes in earnings at the individual level over the same interval, to calculate job mobility rates, and so on.

Finally, the availability of data for three different cohorts permits us to separate the more enduring patterns from those which have been shifting over time, and – more particularly – to see if there has been a general deterioration of fortunes over the period covered, generally thought to have been one of important labour market changes, especially for younger workers, while also bringing the record as up to date as possible.[5]

In summary, the three NGS databases uniquely provide for a focused, detailed, and dynamic analysis of Canadian post-secondary graduates in the critical early years following graduation from the early 1980s into the mid-1990s. The data are, in fact, not only interesting and unique in a Canadian context, but to the best of this author's understanding are unequalled in the world in terms of offering large representative surveys covering various elements of the school-to-work transition over the last decade and a half.

2.1.2 Selection of the Working Samples

First, except for some initial statistics on the basic characteristics of graduates by level, sex, and field of study, the analysis is restricted to those who were successfully contacted and who completed both interviews so that the tracking of outcomes over time would not mix the

[5] The first survey of a 1995 graduates has been carried out, but those data were not ready for analysis at the time this analysis was begun and will obviously lack the second interview data (which are critical) until after those are collected in the year 2000 and then processed.

"composition effects" of changing samples with the actual dynamics of the school-to-work transition.[6]

Second, graduates who obtained an additional degree (i.e., subsequent to the one in 1982, 1986, or 1990 representing the basis of inclusion into the samples) were also deleted from the analysis.[7] This was done on the grounds that such graduates no longer belonged to the original education group (e.g., a Bachelor's graduate might have become a Master's graduate and perhaps changed disciplines) and had in any event been mixing school and work in a way likely to affect the labour market outcomes upon which this analysis is focused. Including on-going students would also have thrown off the precise post-graduation time frame corresponding to the two interview dates (i.e., two and five years after graduation) which holds for the non-continuing group.[8] Finally, little would be gained in including those who obtained further degrees, since such individuals are already represented in the NGS databases at those later degree levels.[9] In short, this analysis of the school-to-work is focused on graduates who had completed their studies and were indeed moving through the school to work transition.

Third, for the analysis of labour market outcomes, part-time workers who cited school as the reason for their only partial involvement in the labour market were also deleted on the grounds that such individuals were – by definition – still principally students and had therefore not yet

[6] Response rates were around 80 percent for the first interview, and 80 to 90 percent of these individuals were successfully interviewed a second time (as documented in Table 1, presented below). If individuals for whom information was collected the first interview only had been included in the calculations of the first period outcomes, changes from the first to second period would have reflected both the actual dynamics for given individuals and the effects of the changing samples. More specifically, improvements from the first to second interview would tend to be biased upwards as those with poorer outcomes tended to be lost from the sample after the first period (as has been verified empirically). At a broader level, it should be assumed that graduates who were contacted and successfully interviewed *either* sample period would tend to be characterised by better outcomes than individuals for whom no data were gathered (*i.e.*, those not successfully located or who did not complete the surveys), thus leading to a more general "upward" bias to the outcomes in any given year (*e.g.*, higher employment rates, earnings levels, and so forth) and the post-graduation dynamics (*e.g.*, greater improvements in employment rates from the first to second interview, greater earnings growth, *etc.*). Nothing can be done regarding this form of response bias, which is in any event common to all surveys of this type (including the widely used Survey of Consumer Finances), but the relatively high response rates which characterise the NGS databases provide some comfort that this source of bias might not be too great in the present context. Finnie [1999a, b] use slightly different selection rules, accepting individuals who responded to just the first interviews in the first interview results in order to facilitate the most comprehensive and representative cross-cohort comparisons.

[7] See Appendix A for the precise description of this selection.

[8] It is, furthermore, impossible to identify the specific field of study in which a new degree was obtained as of the 1984 survey for the 1982 graduates.

[9] For example, individuals who had previously gone from a Bachelor's degree to a Master's would obviously be represented in the working samples constructed here at the latter level.

entered the school-to-work transition phase of their careers in earnest.[10] Other part-time workers are, on the other hand, included in the analysis, lending it a broad labour market base.

To further focus the analysis on individuals with the most significant labour market attachment and to thereby abstract from labour supply decisions which could affect earnings and other outcomes, separate sets of calculations for all the outcomes presented below restricted to full-time workers were also undertaken. These results (available upon request from the author) were generally very similar in every way to the main findings which include part-time workers presented below, lending an additional generalisability to the findings.[11]

Workers holding other than regular paid jobs (*i.e.*, apart from regular wage and salary workers and the self-employed) were also eliminated from the analysis of labour market outcomes (but not other outcomes), since employment status, earnings levels, and other job outcomes of such family workers, volunteers, and other non-standard workers would be expected to depart from those of others – as verified in a preliminary analysis of such workers. This resulted in a very small number of deletions (under one-half of one percent in each survey). A similarly small number of workers deemed to have unreasonably low earnings were also deleted from the samples.[12]

Finally, observations were deleted where the required information was missing on a variable-by-variable basis, typically resulting in very small numbers of deletions.

2.2 The Analytical Framework and the Variables Used in the Analysis

2.2.1 The Analytical Framework and Reporting Rules

The methodology used in this analysis is quite straightforward. One broad set of outcomes represents the percentage distribution of graduates engaged in certain activities (e.g., those who

[10] An analysis of the 1982 cohort, for which enrolment status as of the interview dates is given in the NGS files (which is not the case for the later cohorts), revealed that most individuals eliminated by this restriction (part-time – student) were in fact full-time students and, conversely, that most full-time students were eliminated by this condition, precisely as wished.

[11] See, in particular, Finnie [1999b] for the earnings patterns of full-time workers only.

[12] Full-time workers with less than $5,000 in annual earnings (the equivalent of a wage of about $3.20 per hour for 30 hours of work per week over 52 weeks) were deleted. This affected no more than approximately one-half of 1 percent of the sample in each year, with a relatively high proportion of the first interview cases (where there were generally more such low earners) being individuals who then obtained a new diploma by the subsequent interview (who were otherwise eliminated from most of the analysis – see above), suggesting the relevant jobs were research assistantships or other such atypical jobs.

went on to obtain another diploma), having a particular status (e.g., employed part-time or full-time or unemployed), or characterised by some other categorical outcome (e.g., having a temporary versus permanent job, being a paid worker versus being self-employed). A second set of results gives the mean values of various outcome measures, such as earnings levels or the evaluation of the job held or the educational program from which the individual graduated.

In most cases, results are presented for graduates of all levels taken together (College, Bachelor's, Master's, and Ph.D.), then broken down along these dimensions. Throughout, results are reported separately for male and female graduates.

Reported statistics are based on a minimum of 30 observations. This rule takes two forms. First, mean outcomes such as earnings levels and the job-education skill match index are reported in cases where the calculations are based on at least 30 observations – a very straightforward and conventional rule. Second, distributions such as employment rates and the percentage of individuals with given job characteristics are reported where i) there are at least 30 observations per parameter for the relevant group, with the number of parameters taken to be the number of cells minus 1 (the number of independent parameters), or ii) there are at least 30 observations in a particular cell. Smaller cells for which the information is suppressed are indicated by a dash. (Zeros are shown as such.) [13]

For all the mean outcomes – earnings, job evaluation scores, and so on – estimated standard errors of the means are also reported. See the last part of Appendix A for further discussion of the standard errors of the index measures used (the job-education skill match, job satisfaction, overall evaluation of the educational program).

[13] The logic behind the second "rule of 30" is as follows. In the simplest case where there are just two possible outcomes (*e.g.*, the percentage of individuals with temporary versus permanent jobs), the proportions in the two cells comprise just one independent parameter. Applying the rule of 30 thus means that (2-1) x 30 = 30 observations are required to report the result for that one independent parameter – even as two numbers are given in the table, these summing to 100 percent. Extending the case by one additional possible outcome implies two independent parameters, with the rule of 30 requiring that there be at least (3-1) x 30 = 60 observations to report the three proportions (which again sum to 100 percent). In short, the general rule of 30 is simply applied to the number of independent parameters to be estimated across any distribution. Finally, where there are at least 30 observations in a given cell, that proportion is reported even if the entire set of percentages do not meet the more general reporting rule on the grounds that the statistic singly conforms to the rule of 30. The choice of 30 as the cut-off conforms to common practice based on the behaviour of parameter estimates across different sample sizes. On the other hand, this set of reporting rules is essentially arbitrary and an alternative approach would have been to report standard errors (or, less interestingly, the coefficient of variation) in every case. The rule of 30 used here is, however, convenient and has a reasonably solid statistical foundation.

2.2.2 The Variables Included in the Analysis

The variables included in the analysis include a mix of conventional measures and others of particular pertinence to recent graduates and the school-to-work transition which merit some explanation – including the transformation of various sets of categorical responses into scalar index measures. This section provides a brief overview of the variables used, while more detailed descriptions of the measures, including precise documentation of the differences across survey years (as noted) and departures from some of the Statistics Canada derivations found directly on the NGS files, are included in Appendix A.

The variables:

i) Further Studies

- *New diploma:* Percentage of graduates who obtained a new diploma by the first or second interview.
- *Post-graduation combinations of work and study (Appendix B):* Combinations of enrolment and employment status (part-time versus full-time for each) as of two precise dates in the year following graduation.

ii) Employment Status Variables

- *Full-time and part-time employment, unemployment:* Definitions essentially follow usual Statistics Canada conventions, except for one small departure related to enrolment status which likely leads to very slight over-estimates of unemployment rates (see Appendix A). The measures of the reasons for part-time work (voluntary versus involuntary) may vary slightly between the first two and last cohorts (Appendix A).
- *Permanent versus temporary job:* Based on specific questions to this effect. The 1987 data overstate the number of individuals in temporary jobs to a small degree, while the reasons for being in a temporary job are available only for 1992.
- *Paid versus self-employed worker:* Standard definitions. Recall that "other" workers (family workers, volunteers, *etc.*) are excluded from most of the analysis (see above).
- *Multiple jobs:* Straightforward definition in all years.

iii) Job Characteristics/Outcomes and Other Evaluative Measures

- *Earnings:* Given on an annual basis, thus representing a rate of pay (as opposed to actual earnings received) which automatically adjusts for irregular work patterns over the course of

the year. Reported in 1995 constant dollars, capped at $143,035, the lowest bound (in real dollars) in the six surveys.

- *Job-education skill match:* The extent to which the skills learned in school are used in the current job. The tables report the means of an index running from 0 to 100 which the author has created from the categorical responses regarding the use of the skills learned at school in the current job given in the NGS data. Higher values indicate a closer job-education skill match. The measure is not necessarily directly comparable across the two earlier cohorts and the last cohort. (See Appendix A for details on the construction of the index, the differences across surveys, and how the measure differs from the job-education skill match variables included in the NGS databases.)
- *Job satisfaction:* The tables report the means of an index similar to the one for the job-education skill match, similarly created from the categorical responses given in the NGS data. Higher values indicate greater overall job satisfaction. The measures should be directly comparable across all survey years.
- *Educational pre-requisites of the job:* The level of education required for the job versus the level obtained at graduation. Not necessarily directly comparable across the two earlier cohorts and the last cohort. (See Appendix A for details, including differences between the constructed measure and the one directly available in the NGS databases.)
- *Overall evaluation of the education program:* Based on the question: "Given your experience since completing the requirements for the diploma/degree...would you have selected the same educational program, a different program, or no program?" for the 1982 and 1986 cohorts, and a similar question regarding the specific field of study for the 1990 cohort. The tables report the mean score of an index constructed from the responses to these questions given in the NGS data similar to those created for the job-education skill match and job satisfaction variables discussed above, with higher values indicating greater overall satisfaction with the educational program. Due to the different underlying questions across surveys, the scores should be directly comparable between the 1982 and 1986 cohorts, but not between those two and the 1990 cohort, with scores for the latter group tending to be higher due to the more limited scope of the underlying question (see Appendix A).

iv) Mobility: Job Changes and Inter-Provincial Migration

- *Change of (main) employer:* Job change (*main* employer) from the first interview to the second.
- *Inter-provincial migration:* Change in province of residence i) from graduation to the first interview, ii) between the two interviews, iii) either one or the other.

3. Empirical Findings

The empirical findings are of two main types: i) outcomes as of the two interview dates, two and five years after graduation, such as employment rates, earnings levels, and job satisfaction as of each of those points in time; and ii) individual level dynamics, such as changes in employment status or the percentage increase in earnings levels from the first period to the second. The discussion of the results is structured along three principal themes:

- the general dynamic nature of the school-to-work transition: outcomes as of two and five years after graduation and the underlying individual level dynamics;
- differences in the patterns by level of education and sex;
- comparison of the results across cohorts.

3.1 Sample Sizes and the Distribution of Graduates by Sex, Level and Field

3.1.1 Sample Sizes and the Underlying Populations of Graduates

Table 1 shows the sample sizes for each of the cohorts. The unweighted numbers represent the number of individuals included in each of the NGS databases (with essentially no restrictions imposed), while the weighted numbers represent the underlying national population of graduates in each of the relevant years. (All results presented below reflect those weights.)

Table 1: Sample Sizes

	1982 Cohort				1986 Cohort				1990 Cohort			
	1984		1987		1988		1991		1992		1995	
	Actual	Wgt.	Actual	Wgt.	Actual	Wgt.	Actual	Wgt.	Actual	Wgt.	Actual	Wgt.
ALL												
Male	13,317	69,709	11,626	68,055	15,356	85,189	13,132	82,358	13,464	80,069	11,215	76,861
Female	13,124	80,040	11,534	78,638	15,528	101,178	13,407	98,294	14,473	102,251	12,557	101,310
Total	26,441	149,749	23,160	146,693	30,884	186,367	26,539	180,652	27,937	182,320	23,772	178,171
COLLEGE												
Male	4,965	22,397	4,451	22,247	5,962	28,556	5,114	27,710	4,018	23,309	3,428	22,896
Female	5,908	30,851	5,261	30,452	6,367	35,310	5,510	34,153	4,737	33,408	4,151	33,274
Total	10,873	53,248	9,712	52,699	12,329	63,866	10,624	61,863	8,755	56,717	7,579	56,170
BACHELOR'S												
Male	4,743	39,595	4,122	38,496	5,576	47,994	4,778	46,412	4,999	47,197	4,150	44,848
Female	4,941	43,997	4,357	43,335	6,269	58,988	5,408	57,498	6,057	60,355	5,245	59,794
Total	9,684	83,592	8,479	81,831	11,845	106,982	10,186	103,910	11,056	107,552	9,395	104,642
MASTER'S												
Male	3,094	7,015	2,627	6,685	3,111	7,767	2,645	7,407	3,388	8,242	2,792	7,876
Female	2,060	4,909	1,731	4,583	2,517	6,418	2,170	6,205	3,097	7,758	2,665	7,529
Total	5,154	11,924	4,358	11,268	5,628	14,185	4,815	13,612	6,485	16,000	5,457	15,405
DOCTORATE												
Male	515	703	426	628	707	872	595	829	1,059	1,321	845	1,240
Female	215	283	185	268	375	462	319	438	582	730	496	713
Total	730	986	611	896	1,082	1,334	914	1,267	1,641	2,051	1,341	1,953

The first striking aspect of these numbers is their sheer magnitude, with the NGS samples thus facilitating analysis at a level of detail that would be impossible with other more general surveys such as the Survey of Consumer Finances, the Survey of Labour Income Dynamics, the General Social Survey, and others. Even at the Ph.D. level (where the NGS databases effectively represent complete censuses of the entire population of graduates) there are between 600 and 1,650 observations across the various surveys, while the sample sizes are well into the thousands at the other levels (College, Bachelor's, Master's).

Also of interest, however, are the increases in the overall number of graduates over time, from approximately 149,700 for the first cohort (based on the 1984 weighted numbers) to 182,300 in the most recent group (1992 weighted numbers), an increase of 21.8 percent, with the later numbers being down slightly (2.2 percent) from the middle cohort (186,400 graduates). Thus, the number of post-secondary graduates increased significantly from the early 1980s to middle of that decade, then dropped off slightly in the early 1990s.

3.1.2 The Distribution of Graduates by Degree Level

Table 2a shows the distribution of graduates by degree level. Both the levels and the changes in these levels over time are interesting. We can see, first of all, that College graduates comprised a declining share of post-secondary graduates over this period, falling from 35.6 percent of all graduates in 1982 to 31.1 percent in 1990. These declines were matched by increases in the shares of graduates at the other levels: from 55.8 percent to 59.0 percent on the part of Bachelor's graduates, from 8.0 percent to 8.8 percent at the Master's level, and from .6 percent to 1.1 percent for Ph.D. graduates.

Table 2a: The Distribution of Graduates and Percentage of Female Graduates by Level of Education

	1982 Cohort		1986 Cohort		1990 Cohort	
	% by Level	% Female	% by Level	% Female	% by Level	% Female
College	35.6	58	34.3	55	31.1	59
Bachelor's	55.8	53	57.4	55	59.0	56
Master's	8.0	41	7.6	46	8.8	48
Doctorate	0.7	29	0.7	35	1.1	36
	100		100		100	

Note: The percentages in this and all following tables do not necessarily add up to 100 due to rounding.

The overall rise in the number of post-secondary graduates across cohorts noted above was, therefore, mostly driven by increases at the Bachelor's level, these making up approximately 24,000 (or a more than proportionate 74 percent) of the 32,600 increase. On the other hand, the increases in the numbers of graduates were, in proportional terms, even greater at the Master's and Ph.D. levels. That is, the rise in the number of Master's graduates (from 11,900 to 16,000) made up 12.6 percent of the total increase in the number of graduates from 1982 to 1990, but this is considerably higher than their 8-9 percent share of the number of graduates in each of those years. Similarly, the increases at the Ph.D. level (from 986 in 1982 to 2051 in 1990) made up 3.3 of the total expansion of post-secondary graduates, but this was far in excess of their 0.7 - 1.1 percentage shares of the total number of post-secondary graduates in those two cohorts.

Otherwise put, the growth rates in the numbers of graduates from 1982 to 1990 rose monotonically with degree level: 6.6 percent at the College level, 28.7 percent at the Bachelor's level, 34.2 percent at the Master's level, and a rather remarkable 108.0 percent at the Ph.D. level.

Any general discussion of post-secondary education in Canada should probably take such trends into account. What is the role of graduate level education in the new "knowledge based economy," and are the relatively large proportional increases at the Master's and Ph.D. levels a positive development in this regard, or simply a case of "too little too late"? On the other hand, what does the relative shift away from diplomas at the College level mean in terms of the broad goals of satisfying students and equipping the next generations of labour force participants with the most useful forms of human capital in the most efficient manner? Is it, for example, possible that some of the "new" Bachelor's level university graduates might have been better off attending College, with the savings from such a shift (universities are considerably more costly to operate than colleges) ploughed back into the system in a manner which increased the quality of education (and/or decreased the cost) at all levels? And so forth.

3.1.3 The Distribution of Graduates by Sex

Table 2a also shows the percentage of female graduates at each level. The female shares are generally lower at the higher degree levels for each cohort, but these cross-level gaps all narrowed over time. Thus, in the latest cohort women continued to make up more than one-half of all graduates at the College and Bachelor's levels (59 and 56 percent respectively), very close to half at the Master's level (48 percent), and just over one-third at the Ph.D. level (36 percent).

3.1.4 The Distribution of Graduates by Discipline

The distribution of graduates by field of study and the share of female graduates within each discipline at the four degree levels are shown in the various parts of Table 2b. Interestingly, the distributions by discipline were relatively stable at all levels, with the only shifts really worth mentioning being a reduction in the share of education graduates at the Master's and Ph.D. levels; and a decline in "other social sciences" graduates (*i.e.*, all social sciences except commerce, economics, and law, which are shown separately) in the final cohort and a moderate movement towards science and technology degrees at the Ph.D. level – the latter comprising what could be seen as a favourable development in terms of the country's accumulation of technology, a subject pursued in depth in Lavoie and Finnie [1999].

It is perhaps surprising that the distribution of graduates by field was so stable over time, perhaps leading to a number of related questions. Was this stability primarily due to demand side factors (i.e., students' preferences, including those related to labour market developments), supply side constraints (limited course offerings and places in programs), or some combination of the two? Has the "production" of graduates in different fields been as fluid as it should have been as employment opportunities (and employers' needs) have shifted over time? Should the general lack of secular shifts in the distribution of graduates by field of study be cause for worry as the economy moves in directions which would seem to favour certain types of graduates over others? As a concrete example, the share of computer science graduates did not increase in any dramatic fashion across cohorts, despite the evident need for a greater number of graduates with these skills. The patterns are noted and the questions raised, but further investigations along these lines are left to other venues.

As for the share of female graduates, there has obviously been tremendous variation by discipline at all degree levels, but thre are prehaps few real surprises in this regard. Focusing on the Bachelor's and Master's level graduates (the figures are more volatile at the Ph.D. level due to the smaller number of observations, while the College level distributions generally follow those at the university level), women have tended to be over-repesented in teaching/education, fine arts/humanities, the "other" social sciecens, and other health disciplines (i.e., apart from doctors, dentists, pharmacists, and the like – dominated by nursing graduates). Women have on the other hand, been under-represented in commerce (especially at the Master's level),

economics, engineering, computer science, and math and the other pure sciences. Finally, the male-female shares have been relatively equal in law (the figures at the Master's level are unstable due to the relatively small numbers involved), the agricultural and biological sciences, veterinary sciences, and medical professions.

Table 2b: The Distribution of Graduates and Percentage of Female Graduates by Field of Study

College

	1982 Cohort		1986 Cohort		1990 Cohort	
	% by Field	% Female	% by Field	% Female	% by Field	% Female
No Specialization	5	47	4	48	4	56
Arts & Humanities	10	66	10	61	10	65
Nursing	12	94	11	91	12	88
Medical Tech.	5	81	5	81	5	77
Other Health	1	74	1	70	2	75
Electronic Tech.	7	5	7	3	5	9
Math/Comp. Sc.	4	50	6	40	5	33
Gen. Engineering Tech.	3	87	4	11	3	14
Other Engineering Tech.	9	86	8	14	7	18
Natural/Animal Sc.	2	53	2	44	2	50
Primary Industries	3	85	3	18	3	18
Protection/Correction	2	58	3	35	5	39
Soc. Serv./Recr./Sport	4	81	6	80	7	82
Other Social Sciences	4	87	5	88	5	89
Secretarial Services	9	99	8	96	6	92
Other Bus. & Comm.	19	55	16	55	19	62
	100		100		100	

Bachelor's

	1982 Cohort		1986 Cohort		1990 Cohort	
	% by Field	% Female	% by Field	% Female	% by Field	% Female
No Specialization	10	57	4	51	3	56
Elem./Secon. Teaching	12	76	11	71	11	72
Other Education	6	65	5	66	6	66
Fine Arts & Humanities	13	65	16	65	15	63
Commerce	11	38	14	47	13	49
Economics	3	20	3	34	3	27
Law	4	46	3	46	3	49
Other Social Sciences	15	60	17	68	19	66
Agricultural & Bio. Sc.	5	51	5	52	6	58
Veterinary	1	48	1	41	1	56
Engineering	8	10	8	13	7	15
Medical Professions	2	33	2	38	2	43
Other Health	5	84	5	88	5	84
Computer Science	2	24	4	34	2	21
Math. & Other Phys. Sc.	3	30	4	31	4	35
	100		100		100	

Table 2b (Cont.)

Master's

	1982 Cohort		1986 Cohort		1990 Cohort	
	% by Field	% Female	% by Field	% Female	% by Field	% Female
No Specialization	4	30	2	40	1	48
Elem./Secon. Teaching	6	58	8	64	8	70
Other Education	16	49	11	57	12	60
Fine Arts & Humanities	14	61	15	60	15	60
Commerce	17	27	17	27	20	33
Economics	3	29	2	26	2	34
Law	1	-	1	-	1	24
Other Social Sciences	17	46	17	54	16	62
Agricultural & Bio. Sc.	4	42	3	50	4	48
Veterinary	1	24	1	47	1	42
Engineering	7	10	8	10	8	14
Medical Professions	2	54	4	51	2	36
Other Health	4	60	5	59	4	77
Computer Science	1	24	1	20	2	20
Math. & Other Phys. Sc.	4	18	4	22	5	20
	100		100		100	

Doctorate

	1982 Cohort		1986 Cohort		1990 Cohort	
	% by Field	% Female	% by Field	% Female	% by Field	% Female
No Specialization	4	46	0	-	0	-
Elem./Secon. Teaching	3	-	3	68	3	50
Other Education	10	44	7	57	8	55
Fine Arts & Humanities	16	33	25	33	15	46
Commerce	1	-	2	-	2	38
Economics	2	-	2	-	2	19
Law	0	-	2	-	0	-
Other Social Sciences	19	38	19	48	16	50
Agricultural & Bio. Sc.	10	27	8	26	11	32
Veterinary	3	-	2	-	2	-
Engineering	10	5	8	4	14	9
Medical Professions	1	-	1	-	3	50
Other Health	8	27	8	52	8	47
Computer Science	1	-	1	-	2	-
Math. & Other Phys. Sc.	12	13	12	14	15	9
	100		100		100	

Note: In this and all following tables, a dash indicates too few observations to report (see the text for an explanation of the reporting rules).

But again perhaps the most interesting finding is that the patterns did not change a great deal across cohorts, although an increase in the proportion of women in commerce, especially at the Bachelor's level, is worth noting. Other than this, there were no clear shifts in the general tendencies just sketched out, and most disciplines continued to be more or less male or female dominated in the last cohort as the first – again providing the lead-in to any number of questions and avenues for further research.

3.2 Further Studies

3.2.1 New Diplomas

Table 3 shows the percentage of graduates who obtained a new diploma between graduation in the survey base years (1982, 1986, 1990) and the first or second interview. These are also graphed in Figure 1. Bachelor's level graduates were, not surprisingly, the most likely to go on to complete another degree, with rates mostly in the 15 percent range as of two years following graduation, and from 20 to 34 percent by five years later, these rates varying by sex and cohort.

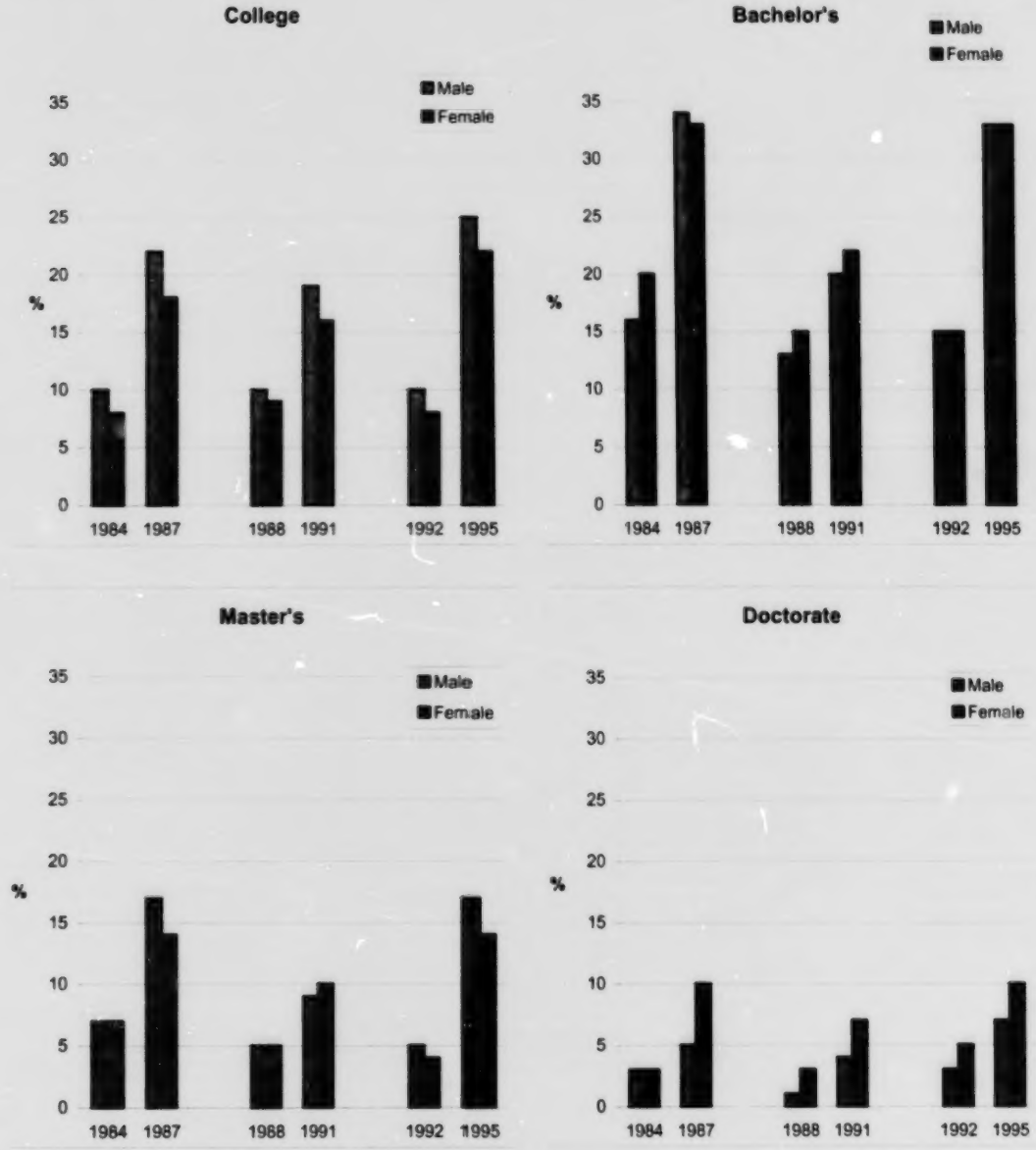
Table 3: Percentage Who Completed a New Diploma by the Relevant Interview

	1982 Cohort		1986 Cohort		1990 Cohort	
	82-84	82-87	86-88	86-91	90-92	90-95
	%	%	%	%	%	%
All:						
Male	13	28	11	18	13	29
Female	14	26	12	19	12	28
COLLEGE:						
Male	10	22	10	19	10	25
Female	8	18	9	16	8	22
BACHELOR'S:						
Male	16	34	13	20	15	33
Female	20	33	15	22	15	33
MASTER'S:						
Male	7	17	5	9	5	17
Female	7	14	5	10	4	14
DOCTORATE:						
Male	3	5	1	4	3	7
Female	3	10	3	7	5	10

Note: Samples exclude those who did not respond to the second interview.

Interestingly, the rates were uniformly lower for the second cohort – but only as of the second interview. These findings suggest there might be roughly two types of Bachelor's graduates who continue with their studies: those who go straight through after finishing their undergraduate degrees and who might be committed to this path more-or-less regardless of the prevailing labour market conditions, and those who make initial forays into the labour market and subsequently return to school if they find their employment opportunities to be relatively limited.

Figure 1: Percentage Who Completed Another Degree by the Relevant Interview



Note: Samples exclude those who did not respond to the second interview.

That is, the relatively high unemployment rates experienced in the early post-graduation years by the 1982 and 1990 cohorts (1983 and 1984 were recession years, while the early 1990s were marked by another recession followed by a very lukewarm labour market recovery – see Finnie [1999a]) may have resulted in a higher proportion of these graduates undertaking further studies, while the lower unemployment rates faced by the 1986 cohort in their early post-graduation years (1987 and 1988 were years of strong economic growth) may have diminished this tendency.[14]

Similar patterns hold at the other levels: the percentage of graduates who obtained an additional degree is similar across all three cohorts as of two years following graduation, but considerably lower as of five years out for the middle cohort relative to the first and last. This relationship between further studies and the business cycle is, furthermore, generally stronger for men than women, which is consistent with the hypothesized market-enrolment connection given that the labour force attachment of male graduates was generally greater than that of female graduates as well (see below).

These results raise questions regarding the factors which affect the decision to go on to further studies and *who* is likely to do so. Although we would generally expect such decisions about continuing on to be at least somewhat related to current labour market opportunities, it would be interesting to know to what degree the system is attracting those with more (relatively) limited labour market opportunities rather than those who would make better graduate school candidates—and better graduate level *graduates—per se*.

With the precise mix of graduates at the College, Bachelor's, Master's, and Doctoral levels – in terms of both their numbers and their quality – now generally recognised as being a very important element of the "knowledge based economy", further investigations along these lines would seem worth pursuing. The ultimate goal might be to obtain reliable estimates of the private and social returns to each degree level, to determine the factors which affect graduates' decisions to continue with their studies, and to identify the policy measures which could help ensure the optimal number and type of graduates using the most efficient policy levers available.

[14] This idea was originally developed in the context of an analysis of engineering graduates in joint work with Marie Lavoie (Finnie and Lavoie [1997]).

The numbers presented here could provide some motivation and a starting point for such investigations, while the NGS data could perhaps be useful for pursuing these issues further. [15]

3.2.2 Diploma Dynamics

Table 4 shows which particular diplomas were obtained by those individuals who continued with their studies.[16] Perhaps the most intriguing aspect of these results is the rather high proportion of diplomas at the same or lower level than the one obtained in the survey base year. Amongst Bachelor's graduates, for example, just 30 to 40 percent of the new diplomas were at the Master's or Ph. D. level, with the rest being at the College or (again) Bachelor's level.

There are, however, many reasons for these relatively high rates of "non-progression": some individuals begin with a certificate program and continue on to the formal Bachelor's degree once this is completed; others do an additional year or so beyond their original degree in order to pick up a different field of concentration; and first professional degrees are included at the Bachelor's level (consistent with their treatment in the NGS data and most standard education statistics). It is, therefore, perhaps not so surprising that approximately one-half of all new diplomas obtained by Bachelor's graduates were at that same level, with the various underlying representing quite different paths—some representing "normal" educational pathways (*e.g.*, going on to professional school), others indicating "back-tracking", and so on.[17]

Perhaps of greater interest, then, are the patterns of clear "backtracking". For example, as many as 26 percent of the new diplomas obtained by Master's graduates were at the College level

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[15] One route would be to use the conventional human capital investment approach to model the individual's choice of going on to further studies in an econometric framework where the principal benefits were the enhanced career opportunities (proxied by employment rates and earnings levels) at the higher degree levels and the costs were defined in terms of foregone earnings over the additional years spent in school plus any direct costs. The NGS data could, in particular, be used to model the decision to continue or not at the point of graduation and in the years immediately following – that is, at precisely the point when such decisions are made.

[16] There are too few observations to report these distributions at the Ph.D. level.

[17] Tighter categories could be defined in some of the years, allowing the differentiation of certificates and other related awards from the formal Bachelor's degree, to identify first professional degrees, and so on, and the same could be done at the other degree levels. One problem here, however, is that such an exercise could not be carried out in a consistent fashion across all three cohorts, due to the given differences in the categories of the degrees awarded (original and/or subsequent) across the surveys. Second, there would remain considerable uncertainty even after the construction of such precise pathways, since the same diploma can mean different things in different situations, including different rules across different institutions (*e.g.*, at some universities, a second Bachelor's degree is not awarded, with certificates given instead; while certificates indicate a much shorter "sub-Bachelor's" program at other places). In short, such a greater detailing of educational pathways would be interesting, but comprise a relatively complex and at the same time uncertain exercise.

(females, 1990 cohort), and another 29 to 45 percent were at the Bachelor's level – although these again include first professional degrees (as mentioned above), while not all individuals who continued on to a Ph.D. (a "normal" path) would have completed their studies by the second interview date, thus biasing the numbers on that path downward. For Bachelor's graduates, around 10 percent of all new degrees were at the College level for the first cohort, but the figures rose to between 15 and 20 percent for the two later cohorts. We might, therefore, conclude that "non-standard" educational pathways have not been uncommon, and that there was a general increase in the incidence such "non-standard" career profiles over time.

Table 4: Diploma Dynamics

	Next Diploma			
	College %	Bachelor's %	Master's %	Doctorate %
1982 Diploma				
MALE				
College	52	45	3	0
Bachelor's	8	54	38	1
Master's	7	36	34	22
Doctorate	-	-	-	-
FEMALE				
College	58	40	2	0
Bachelor's	11	54	35	1
Master's	6	44	38	13
Doctorate	-	-	-	-
1986 Diploma				
MALE				
College	76	22	1	1
Bachelor's	17	51	31	1
Master's	19	45	28	8
Doctorate	-	-	-	-
FEMALE				
College	78	20	1	1
Bachelor's	17	55	28	1
Master's	19	43	31	7
Doctorate	-	-	-	-
1990 Diploma				
MALE				
College	59	39	1	1
Bachelor's	18	41	39	2
Master's	15	29	21	35
Doctorate	-	-	-	-
FEMALE				
College	58	40	1	0
Bachelor's	19	49	31	1
Master's	26	35	20	19
Doctorate	-	-	-	-

Note: Samples exclude those who did not respond to the second interview and those who did not obtain a new diploma.

Further investigation of these dynamics would clearly be an interesting undertaking and could—again—perhaps be profitably undertaken with the NGS databases used here (which also include information on the level of education upon entry into the program from which the individual graduated in the base year). It would be particularly interesting to further analyse the factors related to returning to a lower level degree (while sorting out the professional degrees and other more "spurious" influences). Research in this direction would presumably be useful for college and university administrators, education ministries, and students themselves, and could be very helpful in any general analysis of the post-secondary system: what should it do, for whom, and how? Such undertakings are, however, beyond the scope of this study and are left to another project.[18]

3.2.3 Post-Graduation Combinations of Work and Study

As mentioned above, enrolment status as of the interview dates is not available on the NGS data files in most years. Enrolment status at two particular points in time in the year following graduation (January, October) was, however, ascertained, along with employment status (part-time versus full-time for each). These data provide another view of graduates' continuing education in the context of the labour force option for each group of graduates. Given their limited meaning, however, these results are left to the first two tables of Appendix B for the reader to peruse at his or her leisure.

3.3 Employment, Unemployment and Part-Time Employment Rates[19]

3.3.1 Unemployment

Table 5 shows the labour force activity rates of the graduates in the working samples. Unemployment rates, also shown in Figure 2, were generally quite low for all graduates, but were especially diminutive for individuals at the more advanced degree levels, ranging from as low as 2 percent for some groups of Ph.D. graduates to a maximum of 10 percent for College and Bachelor's graduates in certain years.

[18] It would, for example, be interesting to begin by modelling the receipt of a "lower" diploma (or one at the same level) in a descriptive fashion, taking this outcomes to be a function of various aspects of the individual's educational profile and early labour market experiences. Have, for instance, individuals been more likely to return to College if they have certain fields of specialisation or have had disappointing post-graduation job outcomes?

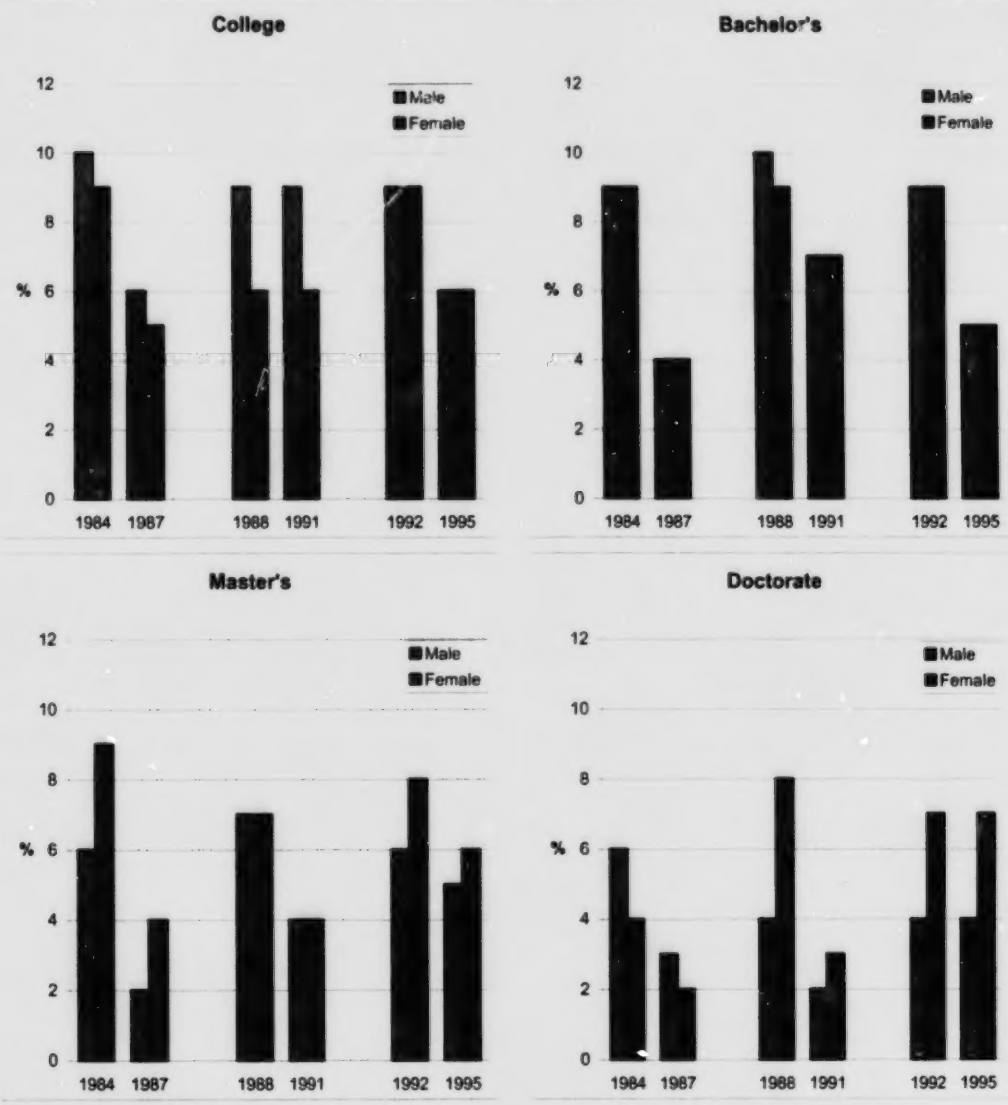
[19] Some of the material included in this section is covered more thoroughly in Finnie [1999a].

Table 5: Employment and Unemployment Rates (% Distribution)

	1st Interview			2nd Interview		
	Employed			Employed		
	Full	Part	Unemployed	Full	Part	Unemployed
1982						
All:						
Male	87	4	9	92	3	5
Female	79	12	9	82	14	5
COLLEGE:						
Male	86	4	10	91	3	6
Female	78	12	9	81	14	5
BACHELOR'S:						
Male	87	4	9	93	3	4
Female	79	12	9	83	13	4
MASTER'S:						
Male	92	3	6	93	4	2
Female	81	10	9	82	14	4
DOCTORATE:						
Male	90	5	6	92	5	3
Female	90	6	4	89	9	2
1986						
All:						
Male	88	3	9	91	2	7
Female	82	10	8	82	11	6
COLLEGE:						
Male	88	3	9	89	2	9
Female	84	10	6	82	11	6
BACHELOR'S:						
Male	87	4	10	91	2	7
Female	81	10	9	82	11	7
MASTER'S:						
Male	90	4	7	92	3	4
Female	82	11	7	84	13	4
DOCTORATE:						
Male	92	4	4	96	2	2
Female	82	9	8	87	10	3
1990						
All:						
Male	86	5	9	92	3	5
Female	79	12	9	82	13	5
COLLEGE:						
Male	85	5	9	90	4	6
Female	78	13	9	79	15	6
BACHELOR'S:						
Male	86	5	9	92	3	5
Female	80	11	9	84	11	5
MASTER'S:						
Male	89	5	6	91	4	5
Female	82	10	8	81	12	6
DOCTORATE:						
Male	94	3	4	94	3	4
Female	87	6	7	85	8	7

Notes: The conventional definition of the unemployment rate is used in this table. Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

Figure 2: Unemployment Rates



Notes: The conventional definition of the unemployment rate is used in this figure. Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

These rates were, furthermore, considerably below those of all labour force participants of the relevant age groups taken together – that is, including post-secondary graduates together with those with less schooling – with the unemployment rates for all younger workers generally ranging from 10 to 20 percent over this same period (the mid-1980s to the mid-1990s), thus implying rates considerably higher than these for non-post-secondary graduates taken alone (see Finnie [1999a] for the relevant comparisons using Labour Force Survey data). The graduates'

rates also generally compare rather favourably to those of men and women of all ages taken together, thus further distancing college and university graduates from "the youth unemployment problem" – an obviously important distinction to make, particularly in the current policy context where the issue receives much attention.

Secondly, and most pertinent to the themes of this paper, the unemployment situation of graduates generally improved quite significantly from two to five years into the labour market, with rates everywhere declining, usually significantly so, and sometimes halving or dropping even further over the associated three year interval. There was, on the other hand, some variation around these general tendencies by cohort, level of education, and sex. In particular, the two-to-five-year improvements were smaller for the middle cohort, which is hardly surprising given that these graduates entered a labour market that was initially very buoyant but then went into deep recession.

Finally, the unemployment rates show only a very slight upward trend across cohorts, with rates generally stable or rising only one or two percentage points from the first set of graduates to the last (interviewed at roughly comparable points in the business cycle), with some of the later groups actually showing lower rates at either the two- or five-year interviews. Thus, in addition to enjoying unemployment rates which were generally significantly lower than those of the general population, post-secondary graduates also appear to have experienced no significant deterioration in employment opportunities from the early 1980s into the middle 1990s – with this result again carrying obvious implications.

3.3.2 Part-Time Employment[20]

The most obvious pattern regarding part-time employment is that the rates are much higher for women than men – at all levels of education and at all points in time. More specifically, women's rates were in the 10 to 15 percent range (as a percentage of all labour force participants, including the unemployed) across the various survey years, except at the Ph.D. level, where part-timers comprised from 6 to 10 percent of the women in the labour force. For men, in contrast, part-time rates varied from 2 to 5 percent. These gender patterns presumably reflect labour

[20] Recall that individuals working part-time precisely because they were in school are not included in this or later parts of the analysis – a restriction which is especially salient (and useful) in the context of the analysis of part-time work. (See the related discussion in the data section 2.1.2.)

supply decisions related to having and raising children, other family influences, and the generally looser labour force attachment of women than men (see further on this below).

Regarding the dynamic aspect of part-time work, the gender differences were generally reinforced over time, with the proportion of female graduates in part-time jobs generally rising to a moderate degree over the post-graduation years, while men's part-time rates were mostly stable or fell slightly, presumably – as with the declines in unemployment rates – reflecting improved employment opportunities in the years following graduation.

Like the unemployment rates, there were no clear patterns in the rates of part-time work across cohorts, with comparisons of the first and last cohorts hinting at slightly higher rates for the later group as of two years after graduation, but marginally lower rates three years later. At a time when it is often taken for granted that there have been increases in "non-standard work" in general, and part-time work in particular – especially amongst the young – the data provide no empirical evidence of this phenomenon for the case of post-secondary graduates. The broad policy implications are again clear.

Table 6 probes further into the part-time phenomenon by showing the percentage of part-time workers who were in such jobs involuntarily (see Appendix A for the precise definition and construction of this measure, including the small difference across surveys). Women were, as anticipated, much less likely to be in part-time jobs involuntarily than were men, and their rates generally declined significantly from the first interview to the second for each cohort, especially at the College and Bachelor's levels. More specifically, the number of women who would have preferred full-time positions represented 71, 59, and 72 percent of all those with part-time jobs as of the two-year interviews for the three cohorts respectively (all graduates taken together), whereas the comparable five year rates were 46, 31, and 55 percent.

As for the percentage of *all* female workers involuntarily in part-time jobs (shown in parentheses in the table), these rates also fell from two to five years following graduation – the net result of the moderate increases in the rates of part-time work seen above and the decreases in the involuntary rates within the populations of part-time workers just reported.

Table 6: Percentage of Workers in Part-Time Jobs Involuntarily

	1982 Cohort		1986 Cohort		1990 Cohort	
	1984 %	1987 %	1988 %	1991 %	1992 %	1995 %
All:						
Male	89 (4)	82 (2)	77 (3)	67 (2)	77 (4)	76 (2)
Female	71 (9)	46 (6)	59 (7)	31 (4)	72 (9)	55 (7)
COLLEGE:						
Male	91 (5)	82 (2)	85 (4)	- (2)	81 (5)	83 (3)
Female	75 (10)	49 (7)	62 (6)	26 (3)	75 (11)	62 (10)
BACHELOR'S:						
Male	89 (4)	85 (4)	70 (3)	71 (2)	76 (4)	76 (2)
Female	71 (9)	45 (6)	59 (7)	35 (4)	72 (9)	55 (6)
MASTER'S:						
Male	74 (2)	- (3)	85 (4)	- (2)	63 (3)	60 (2)
Female	48 (5)	40 (6)	50 (6)	26 (4)	51 (6)	47 (6)
DOCTORATE:						
Male	- (4)	- (5)	- (3)	- (1)	- (2)	- (3)
Female	- (3)	- (6)	- (4)	- (2)	- (3)	- (3)

Notes: The percentage of all workers in part-time jobs involuntarily appears in parentheses. Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

For men, on the other hand, the calculations which can be reported (many estimates have too few observations to report due to the generally low incidence of part-time work amongst men) indicate that the great majority of part-time workers would have preferred full-time work, and this is more or less as true in the five year data as for the two year results. On the other hand, their low rates of part-time work of any sort mean that involuntary part-timers comprised no more than 5 percent of all male graduates with jobs in any survey, with most of these rates falling in the years following graduation.

3.3.3 Employment Status Dynamics at the Individual Level

The longitudinal aspect of the NGS data has also been exploited more fully in order to analyse employment dynamics at the individual level, with Tables 7a (graduates at all levels taken together) and 7b (by level) showing individuals' employment status as of the second interview conditional on their situation as of the first interview.

Probably the most interesting and important result is that only a relatively small proportion of those who were unemployed as of the first interview were again/still unemployed as of the second. For example, in the neighbourhood of 80 percent of all male graduates who were

unemployed in the first period had jobs three years later, and most of these individuals had found full-time positions. Perhaps most importantly, putting these numbers together with the unemployment rates shown in Table 5 (representing the number of graduates unemployed the first period) allows us to deduce that less than 2 percent of all male graduates were unemployed at both interview dates. A similar dynamic is seen for part-time work, with around 70 percent of the first interview part-timers having moved into full-time positions by the second period.

Table 7a: Employment Dynamics, All Graduates

1st Interview	1982 Cohort 2nd Interview			1986 Cohort 2nd Interview			1990 Cohort 2nd Interview		
	Employed			Employed			Employed		
	Full %	Part %	Unemployed %	Full %	Part %	Unemployed %	Full %	Part %	Unemployed %
Male									
Employed									
Full	94	2	3	93	2	6	95	2	3
Part	75	18	6	72	18	10	69	23	9
Unemployed	80	4	16	73	8	18	73	5	21
Female									
Employed									
Full	88	9	4	87	9	5	89	8	3
Part	57	39	4	60	34	6	51	43	6
Unemployed	64	22	15	66	16	18	65	19	16

Note: Samples exclude those who did not respond to the second interview, those who had obtained a new diploma by either interview, and those who worked part-time due to school in either interview.

For women, the story is similar, except that a greater proportion of those who were unemployed in the first period had moved into part-time rather than full-time positions three years later, and more of the first period part-timers had remained in that status three years later – not surprising given the substantial proportion of female part-time workers who held such positions out of choice. In any event, the key indicator representing the overall proportion of female graduates unemployed both periods was in the 1.5 percent range for all three cohorts – again, a rather small number.

Table 7b: Employment Dynamics by Level of Education

College Graduates

1st Interview	1982 Cohort 2nd Interview Employed Full %	Part %	Unemp. %	1986 Cohort 2nd Interview Employed Full %	Part %	Unemp. %	1990 Cohort 2nd Interview Employed Full %	Part %	Unemp. %
Male									
Employed									
Full	92	3	5	91	2	7	93	2	4
Part	73	16	12	68	22	10	71	21	8
Unemployed	82	2	17	70	6	24	72	5	23
Female									
Employed									
Full	85	10	5	86	9	5	86	10	4
Part	57	38	4	59	34	7	48	45	7
Unemployed	71	17	12	69	13	18	64	18	18

Bachelor's Graduates

1st Interview	1982 Cohort 2nd Interview Employed Full %	Part %	Unemp. %	1986 Cohort 2nd Interview Employed Full %	Part %	Unemp. %	1990 Cohort 2nd Interview Employed Full %	Part %	Unemp. %
Male									
Employed									
Full	95	2	3	93	2	5	95	2	3
Part	79	18	3	77	12	11	70	21	8
Unemployed	78	5	17	75	9	16	75	5	20
Female									
Employed									
Full	89	8	3	86	9	5	91	6	3
Part	58	38	5	61	34	5	55	40	5
Unemployed	57	25	17	65	16	19	66	19	15

Master's Graduates

1st Interview	1982 Cohort 2nd Interview Employed Full %	Part %	Unemp. %	1986 Cohort 2nd Interview Employed Full %	Part %	Unemp. %	1990 Cohort 2nd Interview Employed Full %	Part %	Unemp. %
Male									
Employed									
Full	96	3	1	95	2	3	96	2	2
Part	64	-	-	63	-	-	52	33	15
Unemployed	78	10	12	76	15	9	71	7	22
Female									
Employed									
Full	91	6	3	89	9	2	90	6	4
Part	50	48	3	53	41	6	41	50	10
Unemployed	55	31	3	50	37	13	66	20	14

Doctorate Graduates

1st Interview	1982 Cohort 2nd Interview Employed Full %	Part %	Unemp. %	1986 Cohort 2nd Interview Employed Full %	Part %	Unemp. %	1990 Cohort 2nd Interview Employed Full %	Part %	Unemp. %
Male									
Employed									
Full	94	3	2	98	1	2	96	1	3
Part	-	-	-	-	-	-	-	-	-
Unemployed	-	-	-	-	-	-	-	-	-
Female									
Employed									
Full	93	6	1	93	5	2	90	5	5
Part	-	-	-	-	-	-	-	-	-
Unemployed	-	-	-	-	-	-	-	-	-

Note: Samples exclude those who did not respond to the second interview, those who had obtained a new diploma by either interview, and those who worked part-time due to school in either interview.

The numbers vary somewhat by degree level, but the general trends are similar for all groups. Furthermore, the patterns are fairly consistent across all three cohorts. It has already been noted that graduates' unemployment rates were much lower than those of younger workers with less schooling, and also compare favourably to the general populations of more mature workers. This dynamic analysis now allows us to add that those graduates who were unemployed or working part-time involuntarily at a given point in time only rarely tended to not be "permanently" without work or under-employed. It would thus appear that concerns about widespread chronic un- and under-employment amongst recent post-secondary graduates are not borne out by the data.

The other employment status dynamics are also interesting – largely due to the fact that such a dynamic view has never before been possible and the results are, therefore, totally original – but follow more or less directly from the results just seen. That is, with few individuals unemployed both periods, the second period unemployment rates – low as they are (see Table 5) – are filled out by relatively small proportions of graduates moving from full- and part-time employment in the first period to situations of joblessness in the second, 3 to 6 percent in the case of those employed full-time, and 4 to 10 percent in the case of part-time workers.

In summary, post-secondary graduates have been quite successful in findings jobs soon after graduation, their unemployment rates have been driven even lower from two to five years into the labour market, and – at the individual level – most of those who initially experienced a jobless spell or who were limited to part-time employment subsequently found employment in the form of full-time work.

The characteristics of the jobs obtained need, however, to be analysed in order to permit more definitive statements regarding the trends in labour market opportunities in the years following graduation and the relevant cross-cohort trends in these outcomes. It is possible, for example, that declining employment opportunities have been principally manifested in lower quality jobs rather than higher unemployment and part-time employment rates (although one would think that any such tendencies would have also led to at least *some* change in unemployment patterns). We turn to this in a moment.

3.3.4 Expanded Activity Rates

Appendix Table B3 provides evidence using an expanded set of activity rates. Non-labour force participation, sub-divided into those enrolled in school and those not enrolled (see Appendix A for the derivation of this status), are added to the employment and unemployment categories analysed above. Tables B4a and B4b present the related activity dynamics. These numbers provide a broader view of what graduates were doing in the years following graduation (note that graduates who had obtained another diploma are included in these results – the only place in the study with a labour market dimension where this is the case). On the other hand, the figures reveal that the percentage of graduates out of the labour market was generally quite low, that a good proportion of these individuals were not working precisely because they were in school, and that the major findings of the labour market analysis just carried out hold across this alternative set of figures (*e.g.*, only 5 to 10 percent of the individuals who were unemployed the first period were out of the labour force in the second period – that is less than one graduate in a hundred). The alternative results are, therefore left for the reader's own inspection.

3.4 Job Characteristics

3.4.1 Temporary Employment: Levels, Dynamics, and Cross-Cohort Changes

Table 8 and Figure 3 show the percentage of post-secondary graduate workers who were in temporary jobs – as opposed to permanent positions – in each survey. The differences by degree level initially seem quite interesting, with Ph.D. graduates having the highest rates of temporary jobs, Bachelor's graduates coming next, and College and Master's graduates having the lowest rates of temporary employment. In short, there is no neat ordering to the results with respect to level of education. This might, however, be at least partly due to differences in the meaning of "temporary" by level of education, and thus we leave this element of the analysis aside.[21]

[21] University teaching positions, for example, start out as a "temporary" and remain so until tenure is granted, typically in the sixth year. There is, however, typically an initial guarantee of three years of employment and it is relatively rare for these to not be renewed for a second three-year term, often leading to a permanent position. Tenure track positions might, therefore, be considered as permanent jobs with an initial proving period, whereas they might be identified as temporary in the data. The key point is that this would likely be a rather different notion of "temporary" than, say, the sorts of temporary jobs in which College graduates might be found.

Table 8: Percentage of Workers in Temporary Jobs

	1982 Cohort		1986 Cohort		1990 Cohort	
	1984 %	1987 %	1988 %	1991 %	1992 %	1995 %
All:						
Male	18	5	16	9	20	10
Female	21	9	19	12	22	14
COLLEGE:						
Male	17	4	14	7	20	9
Female	16	6	15	7	19	13
BACHELOR'S:						
Male	20	6	18	10	21	10
Female	26	10	22	14	24	15
MASTER'S:						
Male	12	4	13	11	15	9
Female	17	11	19	17	18	15
DOCTORATE:						
Male	29	6	27	15	29	17
Female	34	10	32	21	32	21

Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

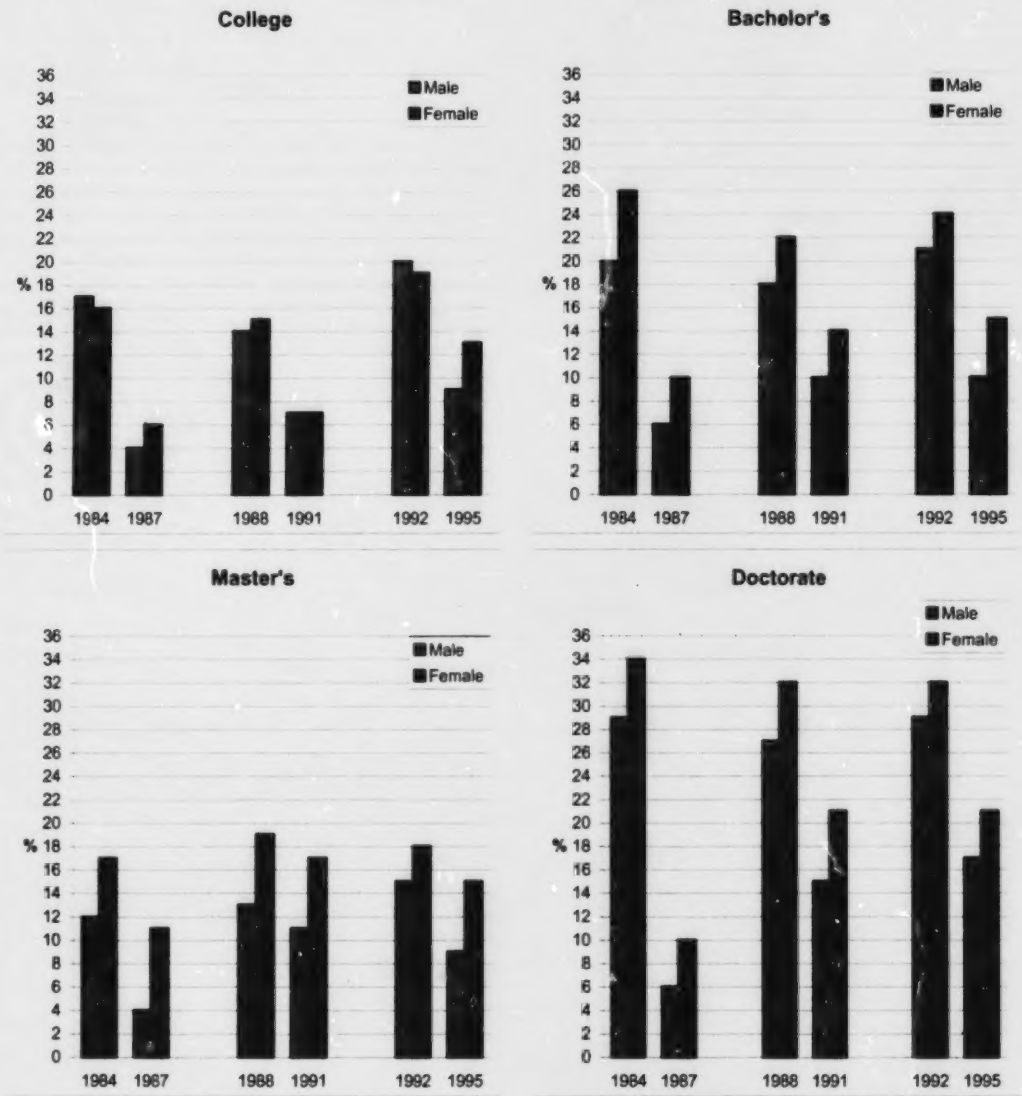
The fact that women were more commonly in temporary jobs than men – except at the College level, where the record is more mixed – is perhaps not surprising, perhaps ascribable to their generally looser labour force attachment (as seen above in the analysis of employment rates). On the other hand, the results in Table 9, representing the reasons for the temporary status (for 1992 only), indicate surprisingly similar responses on the part of men and women, with both groups citing the lack of permanent jobs as by far the most important reason, thus going against any simple supply-side explanation such as the one sketched out above.

What is most relevant to the major theme of this paper, however, are the uniform – and generally large – declines in the percentage of workers in temporary jobs from two to five years following graduation. For graduates of all levels taken together, for example, the percentage of workers in temporary jobs generally fell from the 15 to 20 percent range as of the first interview to rates varying between 5 and 14 percent as of the second interview (although see Appendix A for cautions regarding the 1987 data, which understate the rates of temporary work).[22] These

[22] The undercounting of temporary jobs in 1987 might be especially important for certain specific types of workers, such as Ph.D. graduates who took academic jobs. As noted above, these are normally "temporary" positions until tenure is granted (see above), but would likely be assigned a permanent status in the 1987 data (individuals who were with the same employer since 1984 were automatically assigned as being in permanent positions), perhaps explaining the especially great decline in the percentage of Ph.D. graduates in temporary jobs in that survey.

decreases vary by educational level, sex, and cohort, but the widespread nature and overall strength of the declines represent an important element of the school-to-work transition: a large movement from temporary to permanent employment from two to five years following graduation.

Figure 3: Percentage of Workers in Temporary Jobs



Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

Table 9: Distribution of Reasons Job is Temporary, 1992

	No Jobs	Family	Didn't Want	School
All:				
Male	71	1	13	16
Female	75	2	12	11
COLLEGE:				
Male	79	1	8	12
Female	80	2	10	9
BACHELOR'S:				
Male	65	0	17	18
Female	72	2	12	13
MASTER'S:				
Male	72	0	10	17
Female	82	3	11	4
DOCTORATE:				
Male	77	1	4	17
Female	82	-	-	-

Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, those who worked part-time due to school and those who did not have a temporary job.

There is, however, evidence of a shift in this regard after the first cohort. Although the percentages of individuals with temporary jobs as of two years following graduation were more-or-less consistent across all three cohorts, the reductions in these rates out to the five year interviews were generally smaller for the later groups – although these shifts vary in their timing and extent across education levels, and must be tempered to some degree by the problem regarding the 1987 data mentioned above (perhaps especially for the Ph.D. graduates, as noted).

These shifts are perhaps borne out even more clearly in Tables 10a and 10b, which show the same sort of dynamics at the individual level as were seen for employment status above. These show, first, that in most cases the great majority of individuals in temporary jobs the first period were in permanent positions in the second period (as high as 91 percent amongst male College graduates of the 1982 cohort). The results also show, however, that these transition rates were generally lower for the later groups of graduates, dipping as low as 43 percent for the 1990 cohort of female Ph.D. graduates (perhaps reflecting the virtual shutdown of hiring at the university level in the 1990s).

Furthermore, although transitions in the opposite direction – from permanent jobs as of the first interview to temporary positions as of the second – were quite rare (everywhere less than 10 percent), these rates increased over time, thus comprising another element of the reduction in the percentage of permanent jobs as of five years following graduation.

Table 10a: Temporary/Permanent Job Dynamics, All Graduates

1st Interview	1982 Cohort 2nd Interview		1986 Cohort 2nd Interview		1990 cohort 2nd Interview	
	Permanent %	Temporary %	Permanent %	Temporary %	Permanent %	Temporary %
MALE						
Permanent	98	2	96	4	96	4
Temporary	85	15	76	24	66	34
FEMALE						
Permanent	96	4	94	6	93	7
Temporary	82	18	71	29	63	37

Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school in either interview.

Table 10b: Temporary/Permanent Job Dynamics by Level of Education

1st Interview	1982 Cohort 2nd Interview		1986 Cohort 2nd Interview		1990 Cohort 2nd Interview	
	Permanent %	Temporary %	Permanent %	Temporary %	Permanent %	Temporary %
College						
MALE						
Permanent	98	2	96	4	96	4
Temporary	91	9	82	18	71	29
FEMALE						
Permanent	96	4	95	5	92	8
Temporary	87	13	83	17	70	30
Bachelor's						
MALE						
Permanent	98	2	96	4	96	4
Temporary	81	19	74	26	64	36
FEMALE						
Permanent	95	5	93	7	93	7
Temporary	79	21	67	33	59	41
Master's						
MALE						
Permanent	99	1	97	3	97	3
Temporary	88	12	68	32	63	37
FEMALE						
Permanent	97	3	93	7	93	7
Temporary	79	21	56	44	62	38
Doctorate						
MALE						
Permanent	99	1	94	6	93	7
Temporary	88	12	65	35	60	40
FEMALE						
Permanent	97	3	91	9	96	4
Temporary	84	16	66	34	43	57

Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by either interview, and those who worked part-time due to school in either interview.

In summary, the overwhelming majority of post-secondary graduates have been in permanent jobs even in the early years following graduation and the rates of permanent work have continued to increase from two to five years into the labour market, but there also appears to have been a shift towards more temporary work in the later cohorts – in particular, as of the later point in time following graduation. This shift obviously hints at potentially important changes in the nature of work, with possible ramifications for job security, opportunities for promotion, longer-term earnings profiles, firm specific human capital investments, and so on.

These results also demonstrate once again how it is important to study the school-to-work transition over a relatively extended period of time – with the cross-cohort changes identified here evident only at the later interviews, a full five years following graduation. It would undoubtedly be interesting to probe the temporary/permanent phenomenon in more detail (left to another project), as it will be to see what later cohorts reveal in this regard.

3.4.2 Self-Employment

Being self-employed – as opposed to being a wage or salary worker—could be for one of two broad reasons: i) not being able to find suitable employment of the more conventional status, ii) preferring the self-employment status for personal reasons or due to the short-term monetary benefits and/or enhanced longer-term career opportunities which can accrue.[23] The NGS surveys have not probed into the individual's job status with the sort of questions that would allow us to identify these two categories (or more), but do at least permit the construction of Table 11, which shows the percentage of graduates who were self-employed at each point in time (also shown in Figure 4).

The percentage of individuals who were self-employed varies between 2 and 13 percent for the various groups of graduates as of the six points in time covered by the surveys. As with the temporary-permanent dimension of job status, there are no clear patterns by level of education (except perhaps slightly lower rates at the College level). We might, however, hypothesize that there are differences in the "types" of self-employment (of necessity, by choice) underneath these similar overall tendencies.

[23] A conventional economic approach would typically begin by modelling the choice of class of employment in terms of the present value of each of the options (including all future monetary and non-monetary returns) along with the availability of each type of employment, with the individual then maximising over the relevant choice set.

Table 11: Percentage of Workers Self-Employed

	1982 Cohort		1986 Cohort		1990 Cohort	
	1984 %	1987 %	1988 %	1991 %	1992 %	1995 %
All:						
Male	6	10	6	10	6	11
Female	3	6	3	6	4	6
COLLEGE:						
Male	5	7	5	8	5	9
Female	2	3	2	4	3	5
BACHELOR'S:						
Male	7	12	7	11	7	13
Female	4	7	3	6	4	7
MASTER'S:						
Male	7	9	7	10	7	9
Female	5	7	6	9	6	9
DOCTORATE:						
Male	5	6	6	6	9	9
Female	6	6	14	15	10	11

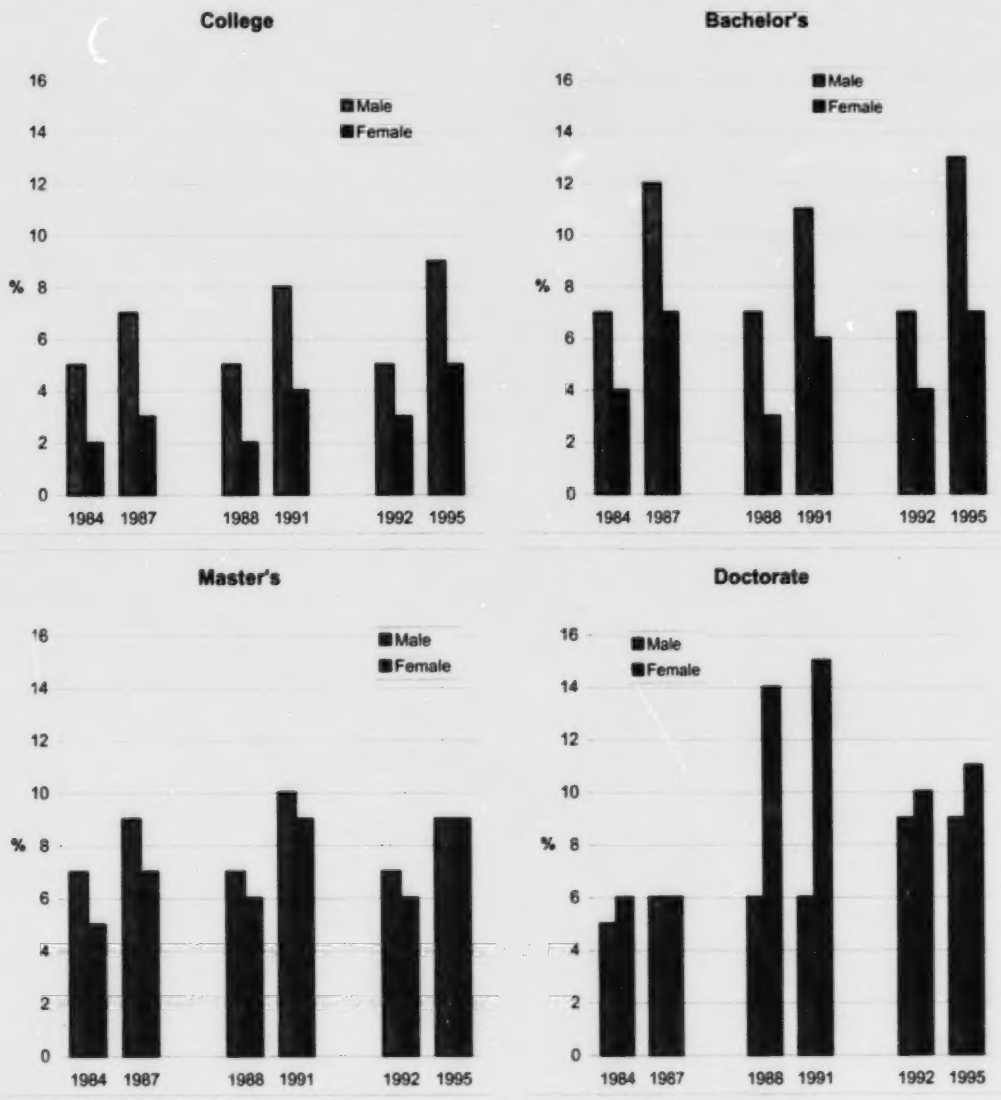
Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

Along the gender dimension, women were about as likely to be self-employed as men at the Ph.D. level, but less so at the other levels. The data do not, however, permit us to do anything more than speculate as to the sources of these differences, which might include a reduced orientation towards risk-taking, a shorter-term career perspective for those with reduced attachment to the labour force, discrimination with respect to credit markets or attitudes towards independent professionals, or others.

The dynamic aspect of self-employment is interesting, with the incidence generally increasing from two years following graduation to five years out—at all educational levels and for men and women alike. Given that labour market opportunities generally tended to improve over this interval (as reflected in the transitions from unemployment and part-time work to employment and full-time time positions seen above), these results would seem to suggest that self-employment has more often stemmed from the advantages of the self-employment option rather than the lack of suitable opportunities with respect to wage and salary positions—at least at the margin.[24]

[24] The phrases "suggest" and "at the margin" are used with emphasis here due to the missing information on the underlying reasons for the self-employment status, and alternative interpretations of a less optimistic nature could be offered to explain these time trends.

Figure 4: Percentage of Workers Self-Employed



Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

The associated dynamics at the individual level are seen in Tables 12a and 12b. These show that while in almost all cases the great majority of graduates had the same employment status as of both interviews, a significant proportion of the graduates who were self-employed the first period had moved into wage and salary positions by the second. Over all levels of education, for example (Table 12a), between 19 and 38 percent of those who were initially self-employed had changed to the more conventional employment status by the second interview.

Table 12a: Self-Employed Dynamics, All Graduates

1st Interview	1982 Cohort 2nd Interview		1986 Cohort 2nd Interview		1990 Cohort 2nd Interview	
	Paid %	Self %	Paid %	Self %	Paid %	Self %
MALE						
Paid	96	4	94	6	93	7
Self	19	81	31	69	32	68
FEMALE						
Paid	97	3	96	4	96	4
Self	30	70	38	62	34	66

Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school in either interview.

Table 12b: Self-Employed Dynamics by Level of Education

	1982 Cohort 2nd Interview		1986 Cohort 2nd Interview		1990 Cohort 2nd Interview	
1st Interview	Paid %	Self %	Paid %	Self %	Paid %	Self %
College						
MALE						
Paid	97	3	95	5	95	5
Self	20	80	26	74	36	64
FEMALE						
Paid	98	2	97	3	97	3
Self	31	69	58	42	37	63
Bachelor's						
MALE						
Paid	95	5	93	7	92	8
Self	19	81	34	66	32	68
FEMALE						
Paid	96	4	96	4	96	4
Self	31	69	34	66	32	68
Master's						
MALE						
Paid	97	3	95	5	95	5
Self	19	81	32	68	28	72
FEMALE						
Paid	98	2	96	4	96	4
Self	22	78	28	72	36	64
Doctorate						
MALE						
Paid	98	2	98	2	97	3
Self	-	-	23	77	30	70
FEMALE						
Paid	100	0	97	3	96	4
Self	-	-	18	82	19	81

Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by either interview, and those who worked part-time due to school in either interview.

The increases in the incidence of self-employment across the two interviews for each cohort were, therefore, driven by the relatively small proportions of individuals (3 to 7 percent) who switched from wage and salary work to self-employment over this interval, with these smaller proportions applied to the larger bases represented by the wage and salary group in the first period. There was, on the other hand, significant variation in these dynamics by sex-education group and cohort (Table 12b), although some of this volatility is surely due to the relatively small numbers involved in some of the cases. Of particular interest are the somewhat higher proportions of female Ph.D. graduates who remained in the self-employed status from the first period to the second – perhaps suggesting that the self-employment option has reflected a somewhat different set of employment options and/or choices for this group of graduates.[25]

Finally, the lack of any obvious cross-cohort trends in the proportion of self-employed graduates across cohorts – at either the two-year or five-year interviews—adds to the evidence on employment rates seen above which suggests that labour markets did not change a great deal for post-secondary graduates from the early-to-mid-1980s to the mid-1990s. On the other hand, caution should be exercised when interpreting these figures regarding the simple incidence of self-employment without, for example, any information on the associated reasons, since the trends in the underlying components and/or related labour market dynamics may indeed have changed.[26] Such changes might, for example, be reflected in the increased tendency to switch from one employment status to the other on the part of the graduates of the later cohorts hinted at in the individual level dynamics shown in Tables 12a and 12b. Further research on the self-employment phenomenon at a more detailed level, might, therefore, be well worth undertaking.[27]

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[25] It is interesting to consider, in this context, the notion that self-employment can be seen as a rational response to labour market discrimination (the self-employed can effectively pay themselves a non-discriminating wage), which might be a particularly viable option at the Ph.D. level.

[26] The observed stability in self-employment rates across cohorts could, for example, be the net result of a decrease in "voluntary" self-employment and an increase in the "of necessity" type.

[27] One way to probe this issue more deeply using the existing NGS data – despite their lack of information on the reason for the self-employment status – would be to compare various job characteristics of the self-employed and wage and salary workers as of both interviews. Such an analysis could, furthermore, exploit the longitudinal aspect of the NGS data by including comparisons of these outcomes broken down by the four "mover-stayer" groups shown in Tables 12a and 12 b. Such an analysis could, for example, how second period outcomes have varied according to first period employment status, or if there have been any shifts in these relationships over time. The use of fixed effects econometric models could be especially revealing in this respect, as they would offer a means of controlling for other factors related to job status (including the sort of omitted individual heterogeneity which is likely to affect the level results), thus permitting us to isolate the job status effects *per se*.

3.4.3 Multiple Jobs

The percentage of graduates holding more than one job is shown in Table 13 (and Figure 5), although these results are somewhat difficult to interpret in any analytical sense, especially given the absence of any information on the reason for holding more than one job, desired hours of work, and other information related to this and related outcomes. [28]

Table 13: Percentage of Workers with Multiple Jobs

	1986 Cohort		1990 Cohort	
	1988	1991	1992	1995
	%	%	%	%
All:				
Male	12	8	12	8
Female	12	9	12	10
COLLEGE:				
Male	11	7	12	8
Female	11	9	14	11
BACHELOR'S:				
Male	12	8	12	8
Female	13	8	11	9
MASTER'S:				
Male	13	9	11	9
Female	14	12	13	10
DOCTORATE:				
Male	13	14	13	12
Female	18	13	15	14

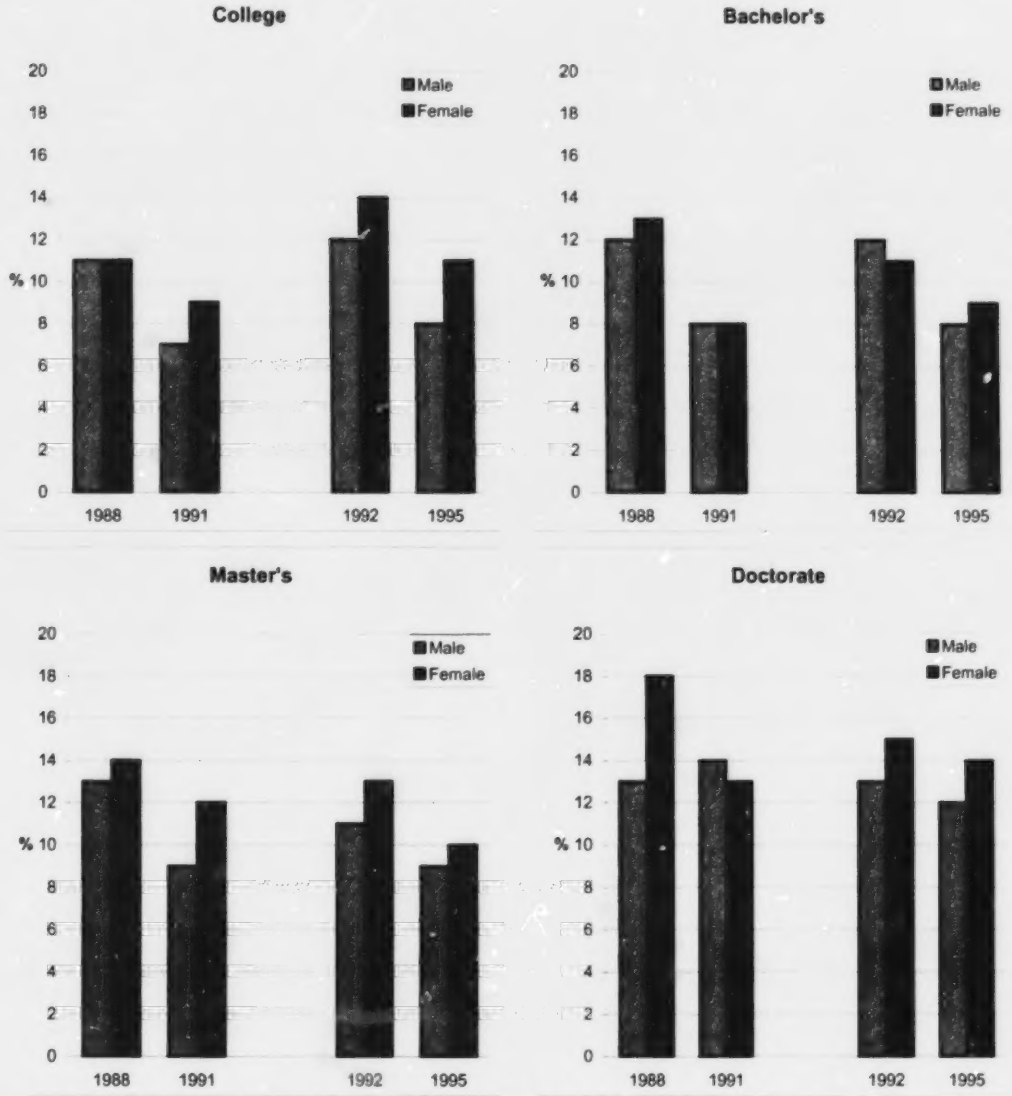
Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

These data, which exist only for the later two cohorts, show that between 3 and 16 percent of all working graduates held more than one job. There are once again no clear patterns by educational level, or by sex. The gender patters might, however, be put in the context of the men's rates of multiple job holding being considerably above their rates of part-time work (as implied by Table 5), while the multiple job and part-time rates are fairly similar for women, thus suggesting that the nature of the underlying factors might differ along gender lines.[29]

[28] The information on the reason the current (main) job is part-time (see above) could provide the beginnings of a deeper analysis in this regard; on the other hand, most of the men with more than one job had at least one (and presumably *only* one) that was full-time, meaning that such information would not apply.

[29] This joint relationship could of course be explored by directly comparing the multiple jobs status with part-time status at the individual level.

Figure 5: Percentage of Workers with Multiple Jobs



Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

As for the dynamic element, the incidence of multiple job holding generally declined from two to five years following graduation, except at the Ph.D. level, where the pattern was more mixed. The individual level dynamics shown in Tables 14a and 14b further indicate that – not surprisingly – the vast majority of those who had just one job in the initial period had a similar employment situation in the second period (89 percent or more), while a substantial proportion of those with multiple jobs moved to a single job situation over the same interval (from 66 to 82

Table 14a: Single/Multiple Job Dynamics, All Graduates

1st Interview	1986 Cohort 2nd Interview		1990 cohort 2nd Interview	
	Single %	Multiple %	Single %	Multiple %
MALE				
Single	93	7	94	6
Multiple	79	21	78	22
FEMALE				
Single	93	7	91	9
Multiple	79	21	76	24

Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school in either interview.

Table 14b: Single/Multiple Job Dynamics by Level of Education

1st Interview	1986 Cohort 2nd Interview		1990 Cohort 2nd Interview	
	Single %	Multiple %	Single %	Multiple %
College				
MALE				
Single	94	6	94	6
Multiple	78	22	79	21
FEMALE				
Single	92	8	91	9
Multiple	77	23	76	24
Bachelor's				
MALE				
Single	93	7	94	6
Multiple	82	18	78	22
FEMALE				
Single	93	7	92	8
Multiple	82	18	77	23
Master's				
MALE				
Single	93	7	92	8
Multiple	73	27	70	30
FEMALE				
Single	89	11	92	8
Multiple	72	28	70	30
Doctorate				
MALE				
Single	89	11	90	10
Multiple	66	34	71	29
FEMALE				
Single	90	10	89	11
Multiple	71	29	66	34

Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by either interview, and those who worked part-time due to school in either interview.

percent). Again appealing to the observation that employment opportunities generally improved in the years following graduation would suggest interpreting these dynamics as reflecting an increased ability of graduates to, over time, find single jobs which meet their needs and wishes in cases where a combination of two different positions might have been required at an earlier point in the school-to-work transition.

With only two cohorts of data available, we need to be extra cautious in looking for "trends" in multiple job holding over time, and none are obvious – neither with respect to the levels as of each of the two-year and five-year interview dates, nor the inter-interview dynamics.

3.5 The Job-Education Skill Match

3.5.1 The Skill-Use Index

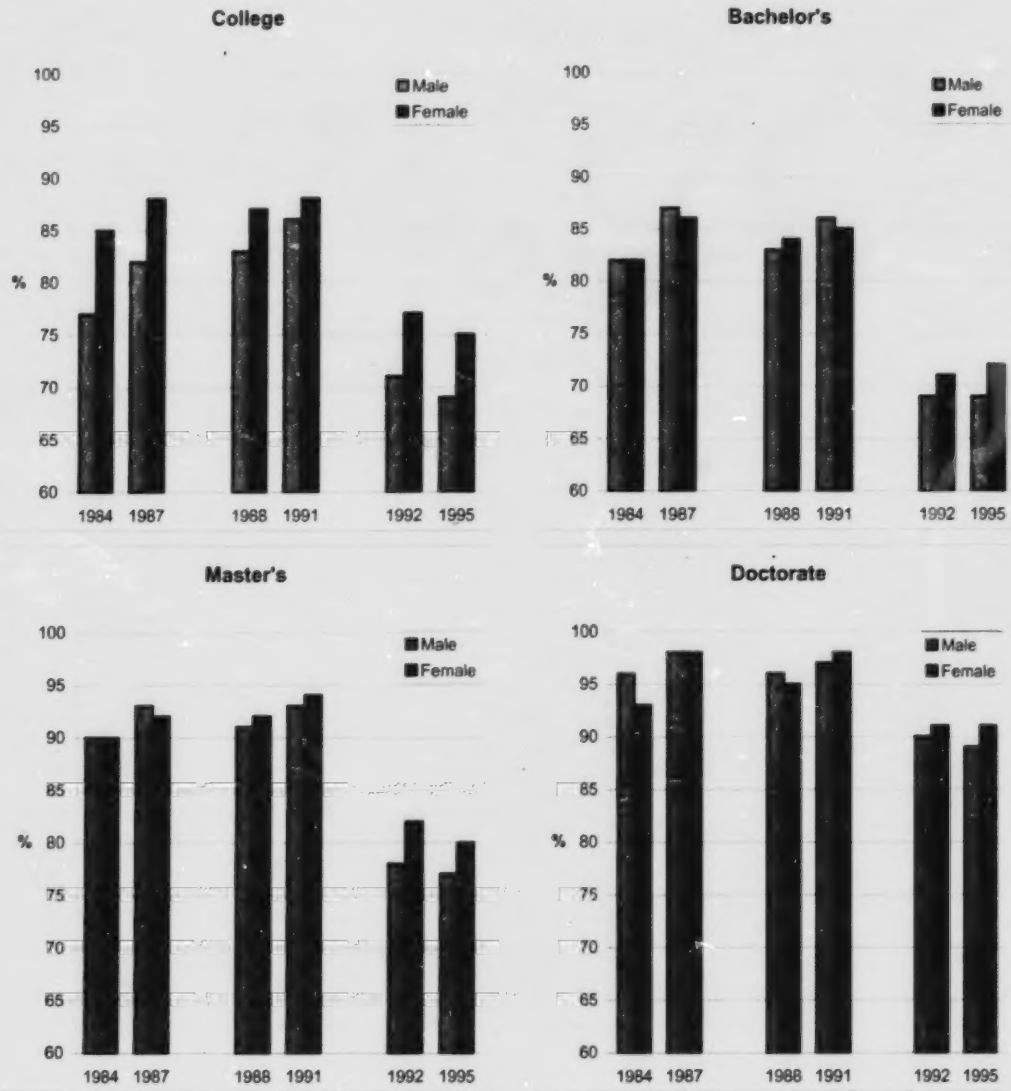
Table 15 reports the index which has been constructed from the responses included in the NGS databases which represents the extent to which the skills developed during the educational program were being used in the current job, with higher values indicating a closer job-education skill match. The results should be directly comparable across interview years for a given cohort, and between the first two cohorts, but not between the first two and last groups of graduates due to a changed ordering of response options given in the NGS questionnaires (see Appendix A). The results are also shown in Figure 6.

Table 15: Index of the Job-Education Skill Match

	1982 Cohort		1986 Cohort		1990 Cohort	
	1984	1987	1988	1991	1992	1995
ALL:						
Male	81	86	84	87	71	70
Female	84	87	86	87	74	74
COLLEGE:						
Male	77	82	83	86	71	69
Female	85	88	87	88	77	75
BACHELOR'S:						
Male	82	87	83	86	69	69
Female	82	86	84	85	71	72
MASTER'S:						
Male	90	93	91	93	78	77
Female	90	92	92	94	82	80
DOCTORATE:						
Male	96	98	96	97	90	89
Female	93 [a]	98	95 [a]	98	91	91

Notes: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school. The means with no letter superscript have standard errors below 1, while those with an [a] have standard errors between 1 and 2.

Figure 6: Index of the Job-Education Skill Match



Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

The job-education skill match scores are, not surprisingly, generally higher at the Master's and Ph.D. levels than amongst College and Bachelor's graduates, while there is no obvious pattern between men and women except, perhaps, for the scores to be somewhat higher for women than men at the College level.

With respect to the dynamic element, however, there were – perhaps surprisingly – no dramatic increases in the index scores from two to five years following graduation: in some cases the

scores are higher, but in many other cases the reverse is true, and the magnitudes of the changes are nowhere very great. It is, however, difficult to know how to interpret these results, especially given their underlying subjective nature. It is, for example, possible that by five years after finishing their programs, graduates have largely forgotten what it was that they learned in school and have a difficult time in differentiating their current skill sets in terms of what was developed during their formal schooling, what was gained on the job, and what is a combination of the two. It is also possible that some graduates were using different skills than those which were gained at school, but which could never have been developed except by building upon that more fundamental base.

For these reasons and others, the results regarding the evolution of the job-education skill match scores over the early years in the labour market should probably not be regarded too seriously in terms of indicating graduates' skill-use patterns. Other, more explicit questions – probably tailored to each discipline/occupation – would likely be required to get at this interesting and important dynamic in a more meaningful way.

3.5.2 Educational Pre-Requisites and Graduates' Qualifications

Another measure of "skill matches" is represented in the comparisons of graduates' educational backgrounds with the prerequisites of the jobs held. The measures which have been constructed for this study (see Appendix A) should tell us something regarding the consequences of the educational decisions that graduates have been making, the performance of the educational system in producing the graduates required in the labour market, the efficiency of the labour market in matching graduates to jobs, and so on – all very interesting and important issues with respect to school, work, and the general functioning of the economy, with a variety of policy implications.

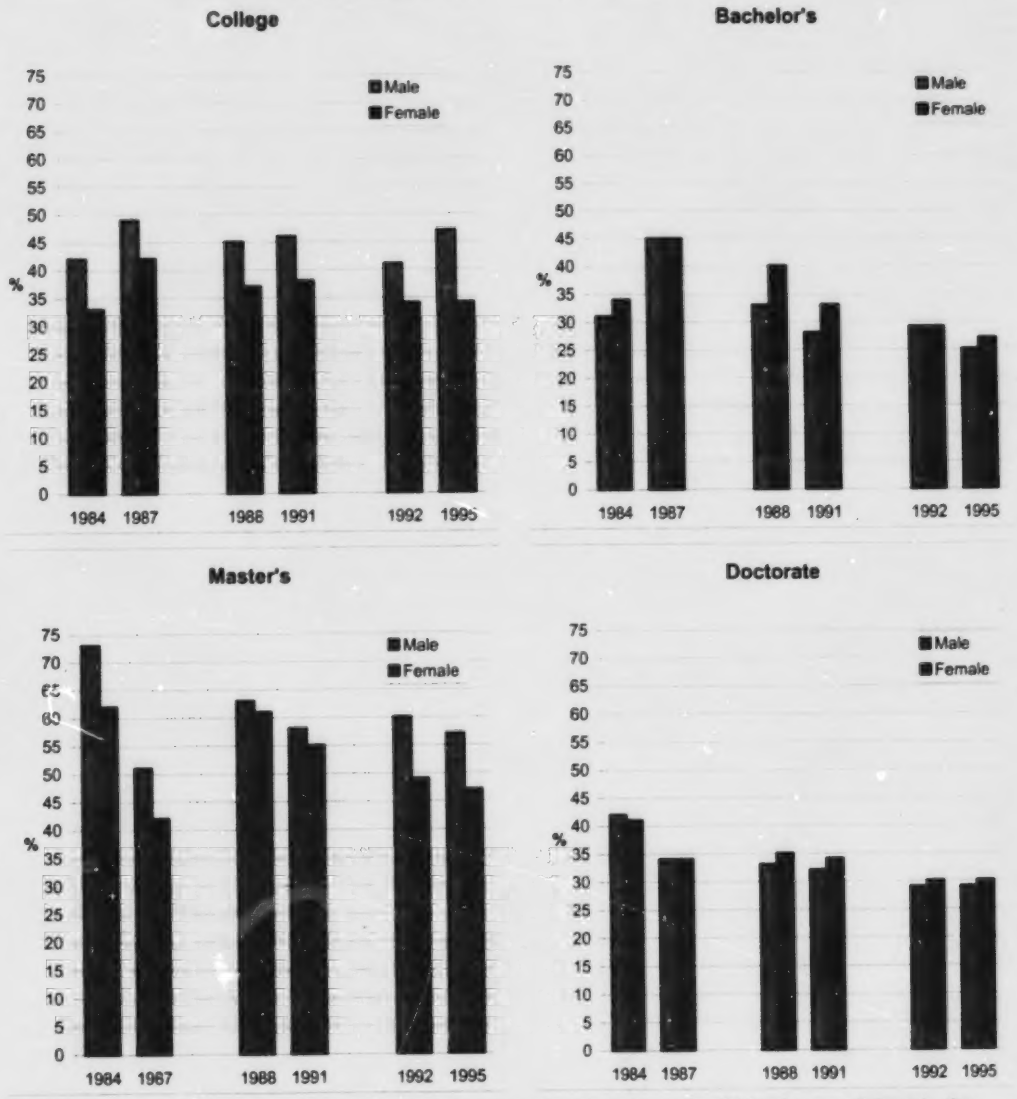
Table 16 thus presents the percentage of graduates who had a higher level of education than that required for the job (as of the starting date), the percentage who had the same level, and the percentage with a lower level of education than that required. Our discussion will mostly focus on the first of these outcomes, principally due to the inherently interesting nature of the "over-qualification" phenomenon, but also because the "under-qualified" outcome is quite rare, thus also leaving the "evenly-qualified" measure as pretty much the obverse of the first. The over-qualification rates are also shown graphically in Figure 7.

Table 16: Education Level Compared to the Level Required for the Job

	1st Interview			2nd Interview		
	Over %	Even %	Under %	Over %	Even %	Under %
1982						
ALL:						
Male	40	59	2	40	56	4
Female	35	62	2	36	60	4
COLLEGE:						
Male	42	55	2	48	48	4
Female	33	63	4	41	54	5
BACHELOR'S:						
Male	31	67	2	29	67	4
Female	34	64	1	29	66	4
MASTER'S:						
Male	73	26	1	64	34	2
Female	62	37	1	54	44	2
DOCTORATE:						
Male	42	58	0	39	61	0
Female	41	59	0	37	63	0
1986						
ALL:						
Male	41	56	3	37	57	6
Female	41	57	2	37	58	5
COLLEGE:						
Male	46	52	2	47	47	6
Female	38	61	1	40	56	5
BACHELOR'S:						
Male	34	63	3	28	66	6
Female	42	56	2	34	61	5
MASTER'S:						
Male	63	36	1	57	37	5
Female	61	38	0	55	41	3
DOCTORATE:						
Male	34	66	0	34	66	0
Female	36	64	0	35	65	0
1990						
ALL:						
Male	36	61	3	40	56	3
Female	33	65	3	34	63	3
COLLEGE:						
Male	41	56	3	47	48	4
Female	34	64	2	34	62	4
BACHELOR'S:						
Male	29	67	4	25	72	4
Female	29	68	3	27	70	4
MASTER'S:						
Male	60	40	1	57	42	1
Female	49	50	1	47	52	1
DOCTORATE:						
Male	29	71	0	29	71	0
Female	30	70	0	30	70	0

Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

Figure 7: Percentage of Workers Over-Qualified



Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

Overall, a substantial proportion of graduates appear to have been over-qualified for their jobs in terms of the required levels of education, with these rates varying from 35 to 41 percent for graduates of all educational levels taken together (varying along this fairly narrow range by sex, cohort, and interview year.) Interestingly, Master's graduates have generally had the highest rates of over-qualification, Bachelor's and Ph.D. graduates the lowest rates, and College graduates have generally been in the middle.

These results could, however, at least partly reflect a certain ambiguity regarding the formal educational prerequisites versus the true requirements of many jobs. In the case of Master's graduates, for example, it might often be the case that only a Bachelor's degree is officially required to apply for a position, but that a Master's degree is needed to successfully compete for the spot. Hence, while the high over-qualification amongst Master's graduates are certainly worth noting, the results should be interpreted with caution, especially with respect to any temptation to conclude that these results show that we have been producing too many Master's graduates. A similar reasoning might, furthermore, apply at the College level: graduates have perhaps often found themselves in jobs where the post-secondary diploma has not been formally required, but where it has been instrumental in actually obtaining the position.

By gender, being over-qualified has been somewhat more common amongst men than women at the College and Master's levels, whereas the differences have more typically gone rather slightly in the other direction at the Bachelor's and Ph.D. levels.

As for the dynamics of the qualifications measure, a significant level of ambiguity again applies, especially since the underlying questions ask about the required qualifications "when first hired". It is, therefore, perhaps difficult to interpret the findings that over-qualification rates have tended to increase in the years following graduation at the College and Bachelor's level, to decrease amongst Master's graduates, and to remain fairly steady for the Ph.D. groups. The Master's results might, however, reflect something of a "correction" for the apparently odd findings (high rates of over-qualification) discussed above.[30]

The "qualification dynamics" at the individual level are shown in Tables 17a and 17b, but these are again difficult to interpret: generally high proportions of graduates are on the diagonals (upwards of 68 percent for the principal over- and even-qualified categories), indicating the same qualifications category in the two interview years, but a substantial proportion of individuals changed status as well. It would, however, probably be necessary to relate these dynamics to job changes, promotions, and other dynamic elements of the employment situation before these results began to tell a meaningful story.

[30] For example, perhaps a significant proportion of Master's graduates gain promotions into positions which more clearly require the advanced degree.

Table 17a: Job Qualification Dynamics, All Graduates

1st Interview	1982 Cohort 2nd Interview			1986 Cohort 2nd Interview			1990 Cohort 2nd Interview		
	Over %	Even %	Under %	Over %	Even %	Under %	Over %	Even %	Under %
Male									
Over	76	22	2	75	23	2	83	16	1
Even	14	83	3	14	83	3	11	88	2
Under	14	24	62	11	25	64	7	28	66
Female									
Over	76	23	2	74	24	2	79	20	1
Even	13	83	3	13	84	3	8	90	2
Under	20	16	64	7	24	69	8	29	63

Note: Samples exclude those who did not respond to the second interview, those who had obtained a new diploma by either interview, and those who worked part-time due to school in either interview.

Returning to the results for each survey year, there would appear to have been a tendency towards moderately lower rates of over-qualification for the later cohorts of graduates. While it is again difficult to know exactly how to interpret these findings, we can at least say that they offer no support for the notion that although employment rates have held up over time, the *quality* of jobs being found by graduates has been deteriorating. That is, the data would seem to indicate that if there has been a change, it has been in the opposite direction, towards "better" – not worse – jobs. On the other hand, the apparently increasingly educational levels required in the jobs graduates have been finding could also represent "qualification creep" – in a weak labour market, requirements may have been arbitrarily raised for some positions. Further analysis would obviously be required to uncover what has really been happening in this regard.[31]

[31] Furthermore, the individual level dynamics shown in Table 17b indicate moderately reduced movements out of jobs for which individuals were over-qualified jobs into jobs for which they are evenly qualified in the last cohort of graduates, although the changes are in many cases not great, and must be accompanied by the caveat that there were slight changes in the educational categories used to create the qualification measures between the first and last cohorts (see Appendix A).

Table 17b: Job Qualification Dynamics by Level of Education

College Graduates

1st Interview	1982 Cohort 2nd Interview			1986 Cohort 2nd Interview			1990 Cohort 2nd Interview		
	Over %	Even %	Under %	Over %	Even %	Under %	Over %	Even %	Under %
Male									
Over	78	19	3	78	18	4	85	13	2
Even	22	75	3	21	75	3	17	81	2
Under	21	24	55	-	-	-	-	-	71
Female									
Over	81	17	2	76	21	3	79	18	3
Even	19	78	3	17	80	3	10	87	2
Under	23	17	60	-	-	-	-	-	68

Bachelor's Graduates

1st Interview	1982 Cohort 2nd Interview			1986 Cohort 2nd Interview			1990 Cohort 2nd Interview		
	Over %	Even %	Under %	Over %	Even %	Under %	Over %	Even %	Under %
Male									
Over	70	29	1	68	30	2	85	13	2
Even	9	88	4	9	88	3	17	81	2
Under	-	-	-	7	24	69	16	13	71
Female									
Over	69	30	1	70	27	3	79	18	3
Even	8	88	4	10	88	2	10	87	2
Under	-	-	-	4	28	69	13	19	68

Master's Graduates

1st Interview	1982 Cohort 2nd Interview			1986 Cohort 2nd Interview			1990 Cohort 2nd Interview		
	Employed			Employed			Employed		
	Over %	Even %	Under %	Over %	Even %	Under %	Over %	Even %	Under %
Male									
Over	82	18	0	85	15	0	87	13	0
Even	19	80	1	19	79	2	16	84	0
Under	-	-	-	-	-	-	-	-	-
Female									
Over	82	17	1	83	17	0	85	15	0
Even	11	89	0	15	84	1	12	88	0
Under	-	-	-	-	-	-	-	-	-

Doctorate Graduates

1st Interview	1982 Cohort 2nd Interview			1986 Cohort 2nd Interview			1990 Cohort 2nd Interview		
	Employed			Employed			Employed		
	Over %	Even %	Under %	Over %	Even %	Under %	Over %	Even %	Under %
Male									
Over	83	17	0	78	22	0	87	13	0
Even	9	91	0	10	90	0	7	93	0
Under	-	-	-	-	-	-	-	-	-
Female									
Over	80	-	-	80	20	0	84	16	0
Even	9	91	0	7	93	0	8	92	0
Under	-	-	-	-	-	-	-	-	-

Note: Samples exclude those who did not respond to the second interview, those who had obtained a new diploma by either interview, and those who worked part-time due to school in either interview.

3.6 Earnings[32]

3.6.1 Earnings Levels

Table 18 reports the mean real earnings of graduates (1995 dollars), while Figure 8a presents the associated graphs. Not surprisingly, mean earnings were substantially higher at each educational level from the College through Master's levels. Amongst Ph.D. graduates, men's mean earnings were slightly lower than at the Master's level (except in 1992, when they were marginally higher), whereas for women they were higher still. These findings indicate, in broad terms, the returns to the different levels of post-secondary education relative to each other.

In terms of gender patterns, women's mean earnings varied from 75 percent to 98 percent the level of men's for a given education group in a given year (the "Female Ratio" rows in Table 18 contain the precise comparisons). Interestingly, the differences generally vary inversely with the level of education: women's earnings were closest to men's amongst Ph.D. graduates, next nearest at the Master's and Bachelor's levels, and lagged furthest behind at the College level.

On the other hand, women's relative earnings levels were higher in each succeeding cohort—for each education group at each of the interview dates, with these gains reducing the gender earnings gap between 22 and 43 percent from the first cohort to the third amongst College, Bachelor's, and Master's graduates, while the gap came close to disappearing at the Ph.D. level (based on comparisons of the 1992 and 1995 levels with those of 1984 and 1987).

As for the "transition" theme, mean earnings generally grew substantially from two to five years following graduation, as seen in the relevant columns in Table 18. The percentage increases in the mean earnings of graduates at all levels taken together taken were 23, 19, and 20 percent for men, and 13, 12, and 11 percent for women across the three cohorts. By level, the increases vary from a low of 7 percent for 1982 female Ph.D. graduates to a high of 26 percent for 1982 male Bachelor's graduates.

[32] See Finnie [1999a, b] for alternative discussions of graduates' earnings patterns by level (full-time workers only), and Finnie [1999c, d] for the analysis of earnings patterns by field of study amongst Bachelor's graduates.

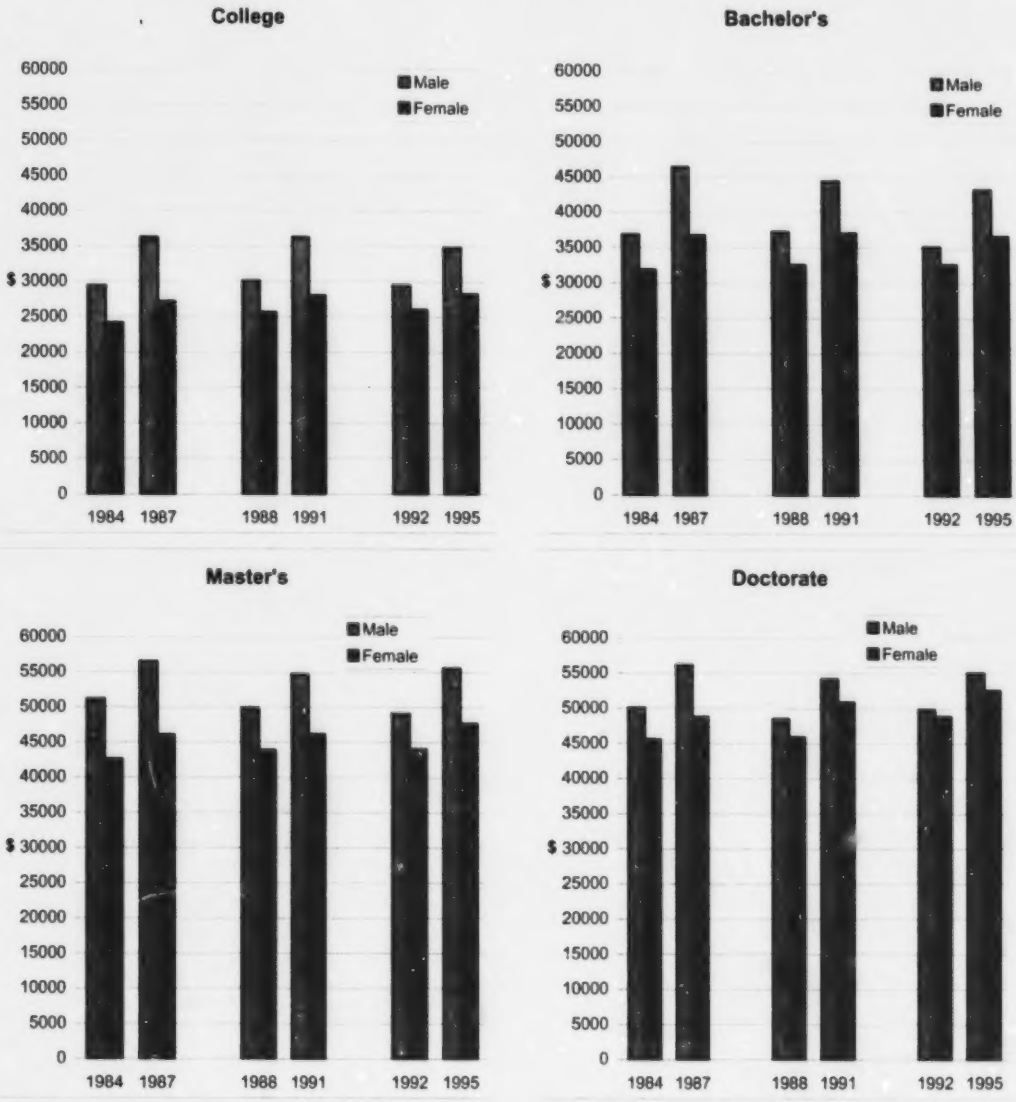
Table 18: Mean Earnings (1995 Constant Dollars)

	1982 Cohort			1986 Cohort			1990 Cohort		
	1984 $	1987 $	Change %	1988 $	1991 $	Change %	1992 $	1995 $	Change %
All:									
Male	35,800	44,100	23	36,000	42,800	19	35,100	42,200	20
	(82)	(104)		(73)	(83)		(78)	(89)	
Female	29,300	33,200	13	30,700	34,400	12	31,400	34,800	11
	(60)	(67)		(56)	(59)		(64)	(62)	
Female Ratio (%)	82	75		85	80		89	82	
COLLEGE:									
Male	29,300	36,200	24	30,000	36,200	21	29,400	34,700	18
	(103)	(120)		(92)	(108)		(97)	(105)	
Female	24,100	27,100	12	25,600	28,000	9	26,000	28,200	8
	(71)	(73)		(75)	(65)		(87)	(72)	
Female Ratio (%)	82	75		85	77		88	81	
BACHELOR'S:									
Male	36,800	46,400	26	37,200	44,400	19	35,100	43,200	23
	(111)	(156)		(100)	(115)		(102)	(123)	
Female	31,800	36,700	15	32,500	37,000	14	32,600	36,600	12
	(82)	(96)		(74)	(80)		(84)	(84)	
Female Ratio (%)	86	79		87	83		93	85	
MASTER'S:									
Male	51,100	56,400	10	49,700	54,600	10	49,000	55,500	13
	(286)	(306)		(280)	(296)		(297)	(307)	
Female	42,500	46,000	8	43,800	46,100	5	44,000	47,600	8
	(288)	(296)		(264)	(281)		(248)	(248)	
Female Ratio (%)	83	82		88	84		90	86	
DOCTORATE:									
Male	50,000	56,100	12	48,400	54,100	12	49,700	55,000	11
	(723)	(799)		(635)	(626)		(608)	(544)	
Female	45,500	48,700	7	45,800	50,800	11	48,800	52,500	8
	(1104)	(1072)		(851)	(1019)		(932)	(810)	
Female Ratio (%)	91	87		95	94		98	95	

Notes: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked due to school. Standard errors are shown in parantheses.

For men, the growth in mean earnings growth was uniformly greater (in percentage terms) amongst College and Bachelor's graduates than at the Master's and Ph.D. levels, meaning that graduates at the more advanced educational levels have been characterised by higher, but flatter, post-graduation earnings profiles. This was also true for women at the Bachelor's level (*i.e.*, steeper earnings profiles than amongst female Master's and Ph.D. graduates) but not for College graduates. These patterns are perhaps seen best in Figure 8b, which plots the earnings profiles which can be constructed with the two data points available for each cohort.

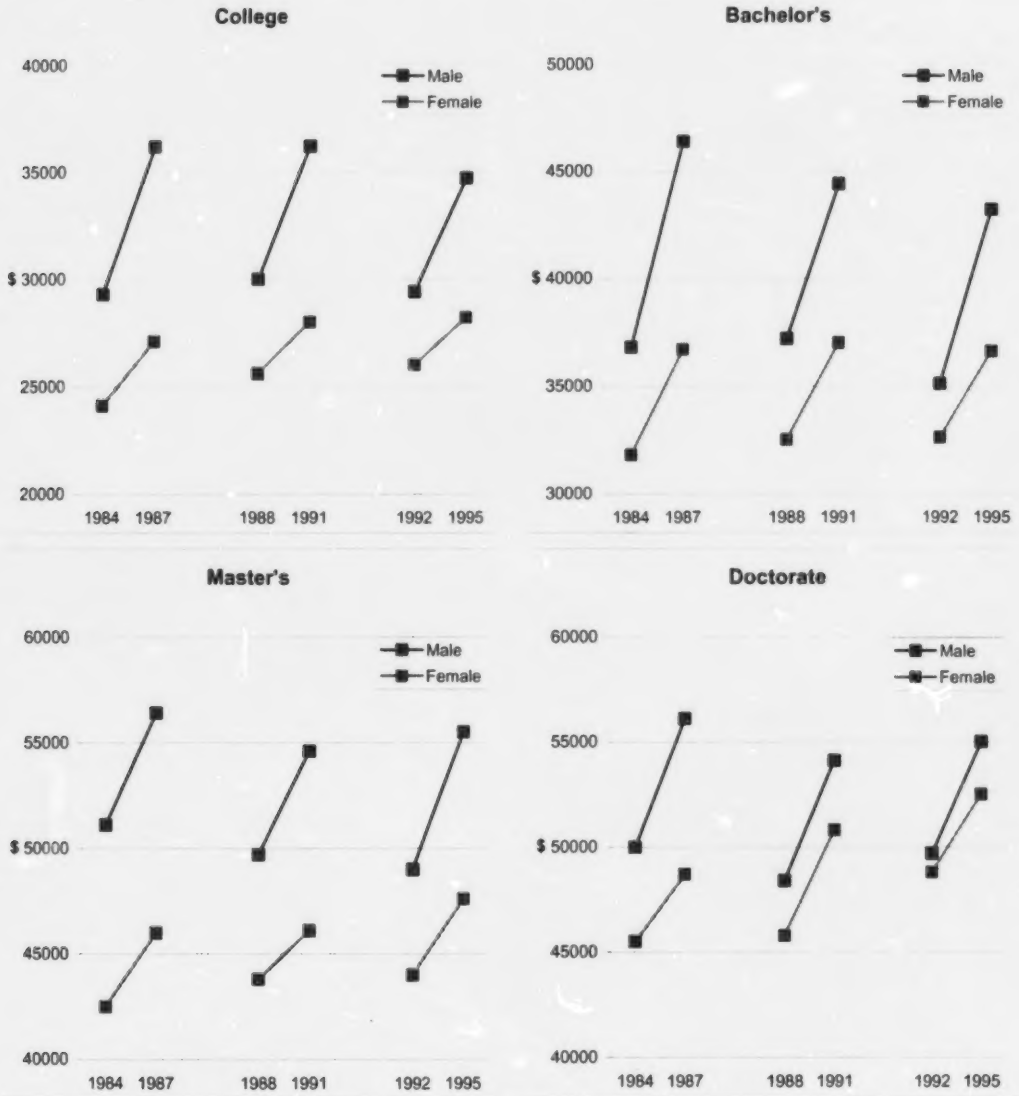
Figure 8a: Mean Earnings (1995 Constant Dollars)



Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

Men's mean earnings rose more than women's from two to five years following graduation for every set of graduates, with the differences in most cases being greater at the College and Bachelor's levels than amongst graduates at the more advanced higher levels. Furthermore, while we should be cautious in identifying "trends" across just three cohorts of data, the male advantages in terms of growth rates were greater for the most recent set of graduates than for the first group at all educational levels below the Ph.D.

Figure 8b: Earnings Profiles (1995 Constant Dollars)



Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

Thus, while female graduates' earnings profiles shifted up towards the males' profiles with each succeeding cohort in terms of the starting *levels*, there was no comparable set of changes in the *slopes* of those profiles. This finding has important implications in terms of the likely shape of the earnings gap in the longer-term – that is, in more of a life-cycle perspective, although any extrapolations beyond the five year horizon provided by NGS data should, of course, be very cautious.

Turning to the cross-cohort trends in earnings levels by sex-education group (as implied by the numbers in Table 18 and Figures 8a and 8b), male graduates' mean earnings ranged from essentially stable to distinctly lower for the later graduates relative to the earlier ones (comparing the 1982 and 1990 cohorts at each of the interview dates), with the greatest change being a decline of 6.9 percent for Bachelor's graduates as of five years after graduation.[33] For women, on the other hand, mean earnings were almost uniformly higher in each succeeding cohort, and in some cases quite substantially so, especially at the College and Ph.D. levels, where the increases approached 8 percent.[34] These are, of course, the trends which underlie the narrowing of the gender earnings gap discussed above.

In terms of the growth in earnings from two to five years following graduation, the cross-cohort patterns are mixed: at the College and Bachelor's levels, both men's and women's earnings grew somewhat more slowly for the graduates of the most recent cohort, while growth rates were relatively stable across cohorts at the Master's and Ph.D. levels (even distinctly higher for the most recent group of male Master's graduates). Any significant change in growth rates could, of course, build over time and accumulate into sizeable differences in lifetime earnings – but it bears repeating that any such longer-range extrapolations made with these limited should be very carefully hedged.

3.6.2 Earnings Patterns and Composition Effects

Throughout these cross-cohort comparisons, it should be kept in mind that there were substantial increases in post-secondary enrolment rates over the period in question, and that these shifts might have affected earnings levels – and other outcomes – through the associated composition effects. If, for example, the extra enrolment came from individuals who generally had below average "ability" (as broadly define) relative to other graduates (and the average graduates of earlier cohorts), this could be expected to drive earnings levels down in the later cohorts – but not due to an change in the "structure" of earnings or the labour market conditions faced by graduates.

---

[33] The percentage changes in mean earnings of male graduates from the first to third cohorts as of two and five years after graduation were as follows: 0.3, -4.1 (College); -4.6, -6.0 (Bachelor's); -4.1, -1.6 (Master's); -.6, -2.0 (Ph.D.).
[34] The percentage changes in female graduates' earnings were: 7.9, 4.1 (College); 2.5, -.2 (Bachelor's); 3.5, 3.5 (Master's); and 7.3, 7.8 (Ph.D.).

For these reasons, the relative earnings levels of the later cohorts reported here might well be lower than they would be were these composition effects controlled for. In short, "the structure" of men's earnings (*i.e.*, the expected earnings of a graduate with a given set of characteristics, including "ability") might not have deteriorated as much as the data in the tables and graphs indicate, while female graduates' earnings might have improved even more than what is shown.

It would of course be desirable to adjust for such influences, but this would be a challenging task, involving assumptions regarding the structure of the associated selection processes and the implementation of various statistical models which have been developed for such purposes (typically coming under the rubric of "Heckman" procedures). Such procedures are, however, more appropriate for a regression model format (not the approach used here) and where the selection process can be observed (also not the case here) and the related stochastic assumptions can built in into the estimating equations. Efforts along these lines are, in any event, beyond the scope of this paper, and we conclude by simply noting that the results should, in this context, have the appropriate caveats attached.

3.6.3 Earnings Dynamics at the Individual Level

We again more fully exploit the longitudinal aspect of the NGS data – in this case by looking at the changes in earnings levels over the early years in the labour market at the individual level, as opposed to the aggregate level changes seen in the means presented above. Table 19 shows the distribution of graduates with respect to the percentage changes in their earnings levels from two to five years following graduation, while Table 20 and Figure 9 show the median values of these changes for each cohort. While looking at these numbers, it should be kept in mind that for individuals at relatively low earnings levels (including most part-timers), relatively moderate changes in dollar terms can translate into rather large changes in percentage terms.

The detailed distributions shown in Table 19 show how volatile earnings have been in the post-graduation years. For example, between one-half and two-thirds of all graduates had either "medium" (10 - 50 percent) or "large" (greater than 50 percent) increases, while significant numbers had smaller gains or declines. This view must, however, be tempered by again noting that relatively small dollar changes can represent large percentage changes (in either direction), especially with part-timer workers included in the statistics.

Table 19: Range of Changes in Individuals' Earnings From Two to Five Years Following Graduation

	Large Decline (>10%)	Small Decline (0-10%)	Small Increase (0-10%)	Medium Increase (10-50%)	Large Increase (>50%)
1982					
All:					
Male	8	10	16	48	18
Female	14	13	17	41	16
COLLEGE:					
Male	9	8	14	47	22
Female	15	9	16	44	15
BACHELOR'S:					
Male	9	9	15	50	18
Female	13	14	17	39	17
MASTER'S:					
Male	8	19	26	38	9
Female	10	18	25	38	9
DOCTORATE:					
Male	9	12	27	43	9
Female	13	14	30	35	9
1986					
All:					
Male	10	9	17	47	17
Female	14	12	18	42	15
COLLEGE:					
Male	10	8	15	48	19
Female	16	10	16	43	14
BACHELOR'S:					
Male	9	9	16	47	18
Female	13	12	18	42	16
MASTER'S:					
Male	10	16	22	42	9
Female	17	15	23	36	10
DOCTORATE:					
Male	8	14	26	41	11
Female	14	14	20	37	14
1990					
All:					
Male	9	12	19	44	16
Female	12	13	23	40	12
COLLEGE:					
Male	11	10	19	44	16
Female	15	14	23	39	10
BACHELOR'S:					
Male	9	11	17	46	18
Female	11	12	23	41	14
MASTER'S:					
Male	8	17	26	39	10
Female	11	19	29	35	7
DOCTORATE:					
Male	7	15	31	36	10
Female	9	15	32	32	12

Note: Samples exclude those who did not respond to the second interview, those who had obtained a new diploma by either interview, and those who worked part-time due to school in either interview.

Table 20: Median Percentage Change in Individual Earnings From Two to Five Years Following Graduation

	1982 Cohort %	1986 Cohort %	1990 cohort %
All:			
Male	18	18	16
Female	13	15	11
COLLEGE:			
Male	23	20	16
Female	15	15	10
BACHELOR'S:			
Male	19	19	17
Female	13	15	12
MASTER'S:			
Male	8	10	10
Female	8	8	7
DOCTORATE:			
Male	11	11	9
Female	7	10	8

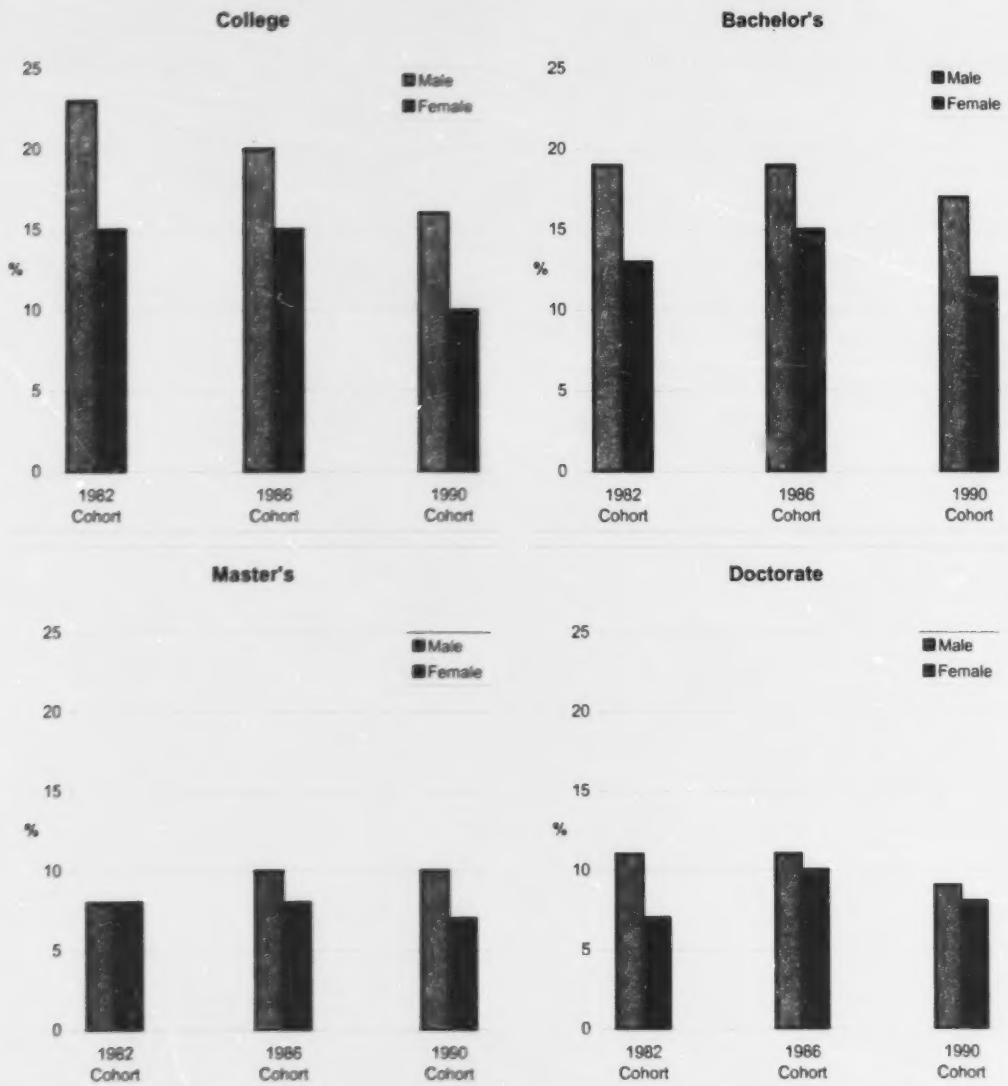
Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

Turning, therefore, to the more robust medians reported in Table 20 and Figure 9, we first see that these figures generally agree with the aggregate level findings in terms of the general magnitudes of the growth rates for each sex-education group (compare the median figures with the figures in the "Percentage Change" columns in Table 18). One pair of significant differences in the two sets of figures is, however, amongst male Bachelor's graduates of the first and third cohorts, where the smaller median changes suggest that earnings growth was more concentrated amongst a reduced number of high-growth individuals (thus pulling the mean up relative to the median). The only other significant difference was for female College graduates of the second cohort, for whom the higher median figure indicates that earnings growth was particularly widespread. Other comparisons between the aggregate level means and individual level medians all agree within 3 percentage points, indicating a general robustness of these findings.

It is, therefore, not surprising that most of the earlier discussions concerning earnings growth based on the aggregate level means carry through to the individual level medians. Men's earnings growth was generally greater than women's, especially at the College and Bachelor's levels, and more or less at least as much so in the later cohorts as in the earlier ones. On the other hand, the male-female differences are generally somewhat narrower with the medians (with the difference actually closed at the Master's level for the 1982 cohort), suggesting that female graduates'

earnings growth was tended to be more widespread than men's.[35] We also see confirmation of the previous patterns that growth rates were generally higher at the College and Bachelor's levels than amongst Master's and Ph.D. graduates, and generally lower for the most recent cohort in the case of College and Bachelor's graduates, but not at the Master's and Ph.D. levels.

Figure 9: Median Percentage Change In Individual Earnings From Two to Five Years Following Graduation



Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the the relevant interview, and those who worked part-time due to school.

[35] Thus, the median growth rates are generally smaller than the changes in the mean earnings levels for the male groups, while this is not true for women – another indicator that earnings growth was relatively more concentrated amongst men.

3.7 Overall Satisfaction With the Job and Educational Program

3.7.1 Job Satisfaction

The scores reported in Table 21 and Figure 10 reflect graduates' responses to questions regarding their overall satisfaction with their current jobs, as translated into an index running on a scale running from 0 to 100, with higher scores indicating greater satisfaction (see Appendix A). Over all, graduates have been what might be called "quite" satisfied with their jobs, with the range of mean scores in the 80 point range (all levels taken together) indicating that given the response options of "very satisfied", "satisfied", "dissatisfied" (or "not satisfied"), "very dissatisfied" (or "not at all satisfied"), the average responses were generally just under half-way between the two most favourable evaluations.[36]

Table 21: Index of Overall Job Satisfaction

	1982 Cohort		1986 Cohort		1990 Cohort	
	1984	1987	1988	1991	1992	1995
All:						
Male	77	80	78	81	80	80
Female	78	78	78	80	80	79
COLLEGE:						
Male	74	78	77	79	80	78
Female	78	78	78	78	80	78
BACHELOR'S:						
Male	78	81	78	80	80	80
Female	77	79	77	80	79	80
MASTER'S:						
Male	82	83	82	84	83	82
Female	81	82	81	83	84	82
DOCTORATE:						
Male	82 [a]	84	84	85	86	84
Female	87 [a]	85 [a]	85 [a]	83 [a]	87	85

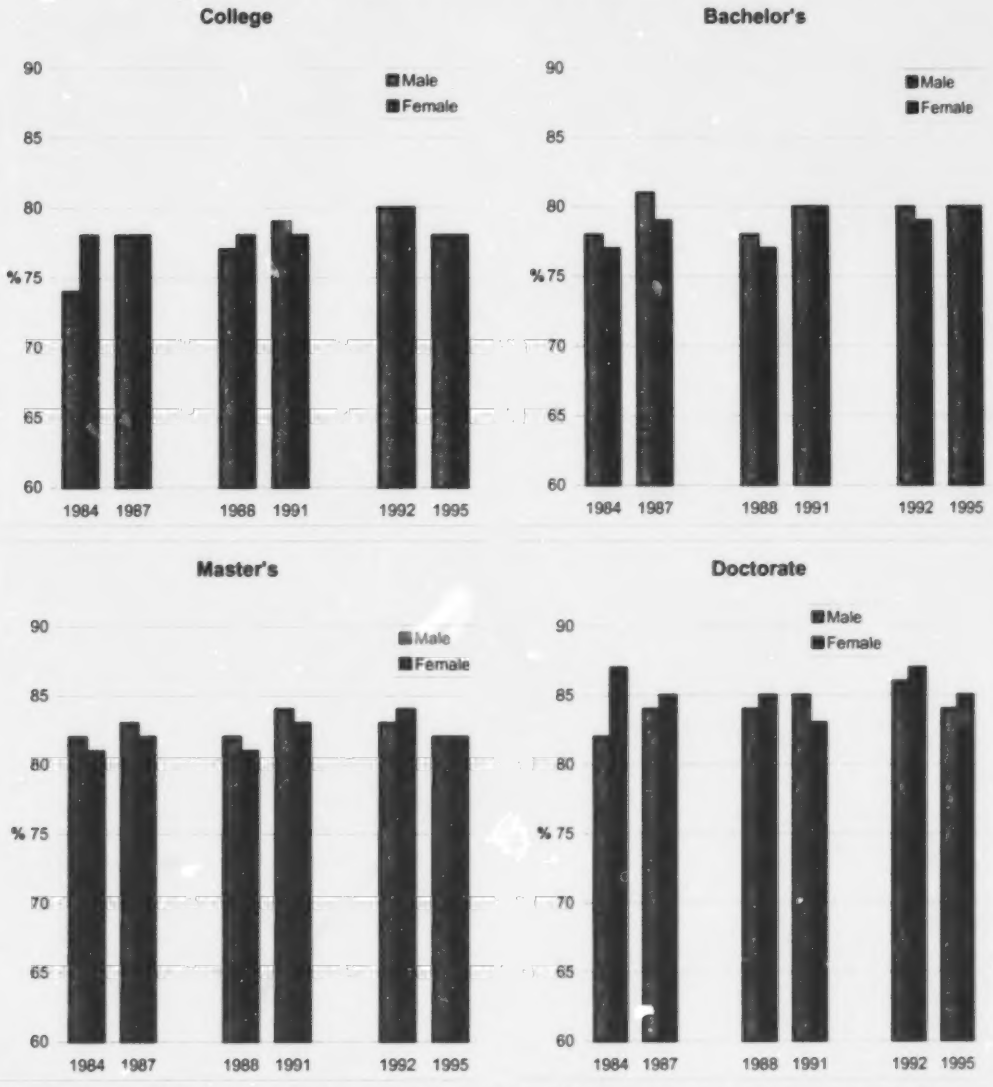
Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school. The means with no letter superscript have standard errors below 1, while those with an *a* superscript have standard errors between 1 and 2.

Perhaps not surprisingly, in most cases the scores increase with the level of education, the only exceptions being the marginally lower scores for female Bachelor's level graduates relative to those at the College level in 1984 and 1988, and the approximately equal scores of female Master's and Ph.D. graduates. On the other hand, although the scores follow this clear pattern

[36] The four categories have index scores of 0, 33.3, 66.7, and 100 respectively (See Appendix A), meaning that the score half-way between the two most favourable responses would be 83.4, which compares to the mean scores of 77 to 80 reported in the table.

and the cross-level differences are generally statistically significant (see Appendix A and the footnotes to the table for explanations of the associated standard errors), the magnitudes of these differences are relatively moderate – ranging from 5 to 9 points from the College level up to the Ph.D. Given the construction of the index, this is approximately the equivalent of one graduate in four giving a response of "very satisfied" rather than "satisfied".[37]

Figure 10: Index of Overall Job Satisfaction



Note: Samples exclude those who did not respond to the second interview, those who obtained a new diploma by the relevant interview, and those who worked part-time due to school.

[37] With each score worth 33.3 points on the index (see above), the indicated switches would increase the average score 8.3 points (.25 times .33).

Seen from an alternative view, even College level graduates were, on average, relatively satisfied with their jobs, while the rise in scores with the level of education was such that at the Ph.D. level the average scores tilted more towards the even more positive "very satisfied" response option.

Interestingly, despite the differences in job characteristics by sex seen in earlier sections, overall levels of job satisfaction are very similar for male and female graduates.

Similarly, despite the extent to which job characteristics and outcomes evolve from two to five years following graduation, the associated levels of satisfaction remain relatively stable – moving no more than 4 points for any particular group (1982 male College graduates), and in come cases improving not at all, or even declining.

These patterns by sex and across interview dates would, therefore, seem to reflect the subjective nature of the job satisfaction measure and indicate that jobs are evaluated in a relative manner – presumably, as compared to expectations, which would themselves be different across groups and shift over time. Hence, female graduates' generally greater incidence of (involuntary) part-time and temporary work, reduced earnings levels, and other "lower" outcomes have not generally led to commensurately reduced levels of job satisfaction, while the general improvements in outcomes over the early years in the labour market, such as the movements into full-time and permanent jobs and increases in earnings levels, have not typically resulted in proportional improvements in job evaluations.[38]

Finally, job satisfaction scores generally rose slightly from the first cohort through the third, thus lending further evidence – albeit of a less objective nature (especially given the comments above) – to the idea that post-secondary graduates have not experienced any significant deterioration in labour market outcomes over this period.

On the other hand, the data also indicate slight differences as of the first and second interviews in this regard: the most recent cohort has uniformly stable or higher job satisfaction scores relative

[38] In related work, it has been seen that a more specific question regarding earnings satisfaction shows similar tendencies – in particular, earnings satisfaction does not seem to generally be related to earnings levels (Finnie [1995], Lavoie and Finnie [1997a, 1997b, 1998]).

to the first cohort as of the two-year interviews, whereas the later cohort's scores are no greater than one index point higher than those of the first cohort, and some of the changes are negative as of the five-year interviews. These results can thus be added to others previously seen – such as the moderate diminution in earnings growth and the switch out from temporary to permanent positions – which suggest that the improvements which occur over the early years in the labour market have perhaps been slightly attenuated for the most recent group of graduates.

3.7.2 Overall Evaluation of the Educational Program

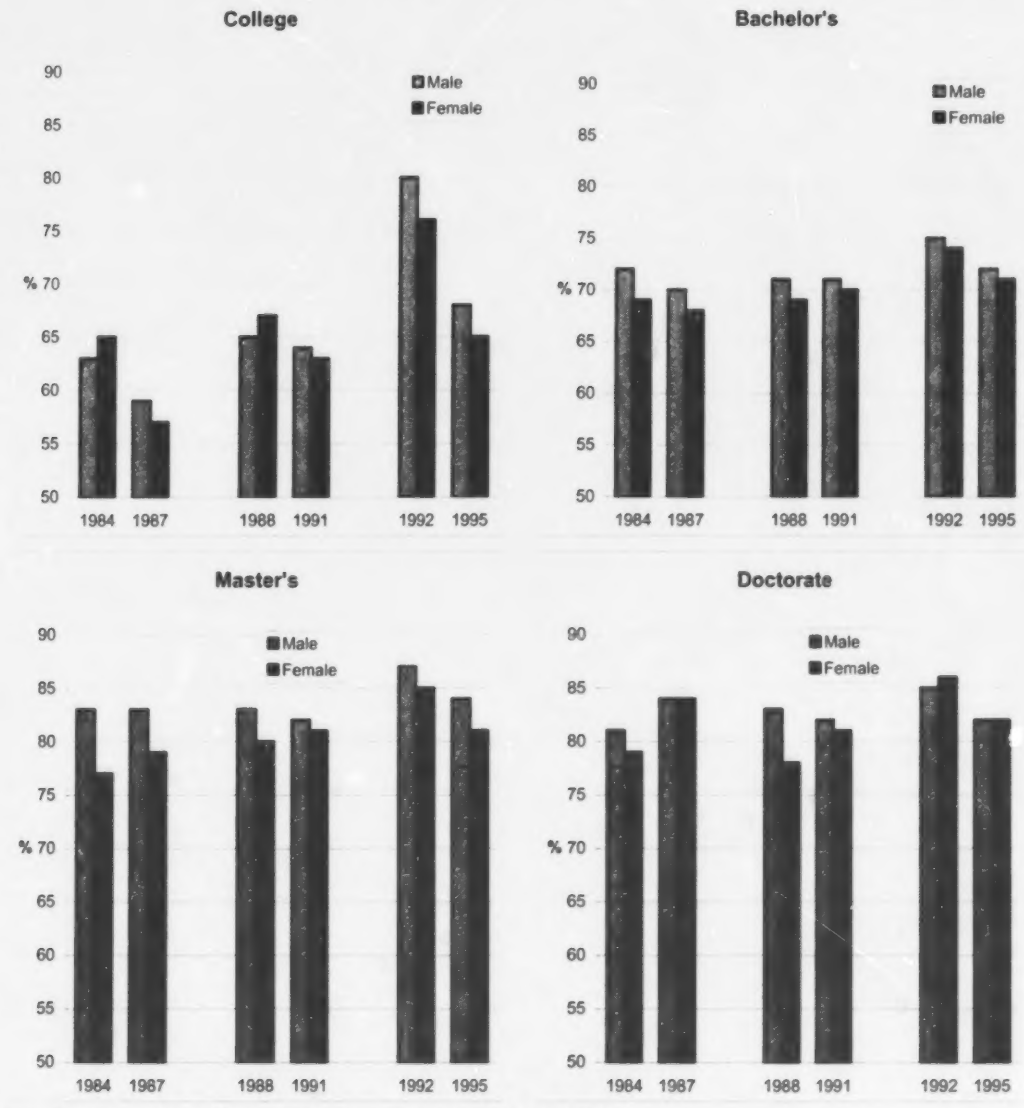
The other evaluation measure concerns the educational program itself. In the two earlier cohorts, the measure is based upon graduates' responses to questions regarding the level and field of the program, while for the third cohort the measure is restricted to the field element. As with the job evaluation measure, the scores were arranged on an index, with the mean scores shown in Table 22 and Figure 11 (see Appendix A).

Table 22: Index of the Overall Evaluation of the Education Program

	1982 Cohort		1986 Cohort		1990 Cohort	
	1984 %	1987 %	1988 %	1991 %	1992 %	1995 %
All:						
Male	70	68	70	64	80	68
Female	68	64	69	63	78	65
COLLEGE:						
Male	63	59	65	64	80	68
Female	65	57	67	63	76	65
BACHELOR'S:						
Male	72	70	71	71	75	72
Female	69	68	69	70	74	71
MASTER'S:						
Male	83	83	83	82	87	84
Female	77	79	80	81	85	81
DOCTORATE:						
Male	81 [a]	84 [a]	83 [a]	82 [a]	85 [a]	82 [a]
Female	79 [b]	84 [b]	78 [b]	81 [a]	86 [a]	82 [a]

Notes: Samples exclude those did not respond to the second interview. The means with no letter superscript have standard errors below 1, those with an *a* superscript have standard errors between 1 and 2, and those with a *b* have standard errors between 2 and 3.

Figure 11: Index of the Overall Evaluation of the Program



Note: Samples exclude those who did not respond to the second interview.

Here, the differences in scores by degree are more substantial – although the patterns have to be carefully interpreted due to the change in the measure from the first two cohorts to the third, as noted above. Specifically, the patterns indicate that College graduates – as opposed to those at the university level – have been much less satisfied than university graduates with their choices regarding the level of their programs (college versus trade/vocational schools on the one hand, university programs on the other), but closer to the others with respect to their satisfaction with their choices of specific fields of study. This is evidenced by the relatively low scores amongst

College graduates in the first four surveys, where both program level and field enter the measure, and their stronger evaluations in the later two, where just field is considered – especially as of the first interview. This evaluation is, however, tempered, by its underlying assumption that the cross-cohort differences in scores are principally driven by the change in the nature of the measure (program and field versus field alone), as opposed to any shift in the actual underlying evaluations with respect to field.

Employing similar logic, the cross-cohort patterns amongst university graduates point to relatively high levels of satisfaction with the levels of their programs, seen in the small differences in the scores in the years the level element is included (1984/87, 1988/91) and the years it is excluded (1992/95). This inference also allows us to interpret the reported scores as coming close to representing the percentage of university graduates who said they would choose the same field again, these varying from 68 to 75 percent for Bachelor's graduates, from 77 to 85 percent at the Master's level, and from 79 to 86 percent at the Ph.D. level. In most cases, women tend to have somewhat lower scores than men.

As for the dynamic element of the evaluations, the scores of College graduates are in every case lower as of the second interviews than the first, especially for the first and (especially) last cohorts, whereas there is no such pattern at the university levels. However, while the different constructions of the measures in the first two and third cohorts mean that we should not go very far in comparing the levels across these periods, at least cautious observations can be made regarding the changes from the first interview to the second, which are all somewhat less favourable for the latest group of graduates relative to the earlier two. That is, all scores actually declined from 1992 to 1995, whereas no such general tendencies are observed for the earlier groups. This result is again consistent with the notion that there has been a smallish change in the evolution of outcomes for graduates over the early years in the labour market.

3.8 Job and Geographical Mobility

3.8.1 Change of (Main) Employer

Table 23 shows the percentage of graduates who changed their main employer from the first interview to the second for the later two cohorts (the measure could not be constructed for the first cohort). Job mobility rates – as defined in this manner (see Appendix A) – over the relevant

three year intervals were just over 40 percent for the men and women of the earlier cohort, and 35 and 31 percent amongst the later groups of male and female graduates, respectively.

Table 23: Percentage of Workers Who Changed Employers Between Interviews

	1986 Cohort %	1990 cohort %
All:		
Male	43	35
Female	41	31
COLLEGE:		
Male	44	36
Female	44	31
BACHELOR'S:		
Male	45	37
Female	41	32
MASTER'S:		
Male	32	28
Female	35	25
DOCTORATE:		
Male	34	27
Female	26	25

Note: Samples exclude those who did not respond to the second interview, those who had obtained a new diploma by either interview, and those who worked part-time due to school in either interview.

Job mobility was similar at the College and Bachelor's levels, and again at the Master's and Ph.D. levels, with the latter two groups showing significantly less turnover than the former. That is, employment stability amongst post-secondary graduates was significantly greater at the advanced degree levels – an interesting finding given that the results might, from a theoretical perspective, have gone either way.[39]

Female graduates had lower turnover rates than male graduates in seven of the eight relevant comparisons in the table (*i.e.*, graduates of a given level of education in a given cohort). This result might have interesting implications for our general understanding of the labour market behaviour of male and female graduates generally, and their associated human capital investments in particular. It has, for example, traditionally been thought that job turnover was greater amongst women than men, that this higher turnover impinged on women's investments in

[39] A change of employer can represent leaving one job for a better one ("good" mobility), being forced out of a preferred position due to some sort of layoff ("bad" mobility), bouncing from one mediocre job to another (mobility which represents a general dearth of good job opportunities), and so on. The mobility patterns observed here thus represent the totals of these various specific types for each group of graduates.

firm specific human capital (especially), and that these dynamics provided at least some of the explanation of why women had lower wages – and less growth in wages over time – than men. This line of reasoning would, however, not seem to apply to recent post-secondary graduates in Canada, as the tendencies are observed to be in the opposite direction.[40]

Finally, the overall decline in mobility rates from the second to third cohorts seen at the aggregate level holds for all specific sex-education groups, and some of the changes are quite substantial (although in other cases they are smaller, including only a marginal difference for Ph.D. women). While we need to be very careful in interpreting the findings across just two cohorts in terms of "trends" – especially given that the relevant intervals cover two quite different points in the business cycle – we might at least cautiously entertain the notion that these patterns could point to certain changes in the nature of work not necessarily reflected in the other outcomes seen to date.

3.8.2 Inter-Provincial Migration

Table 24 presents the record regarding inter-provincial mobility, showing the percentage of graduates who moved from one province to another i) between graduation and the first interview, ii) from the first interview to the second, and iii) during either of these intervals (*i.e.*, the cumulative total). Figure 12 shows the results graphically to especially good effect.

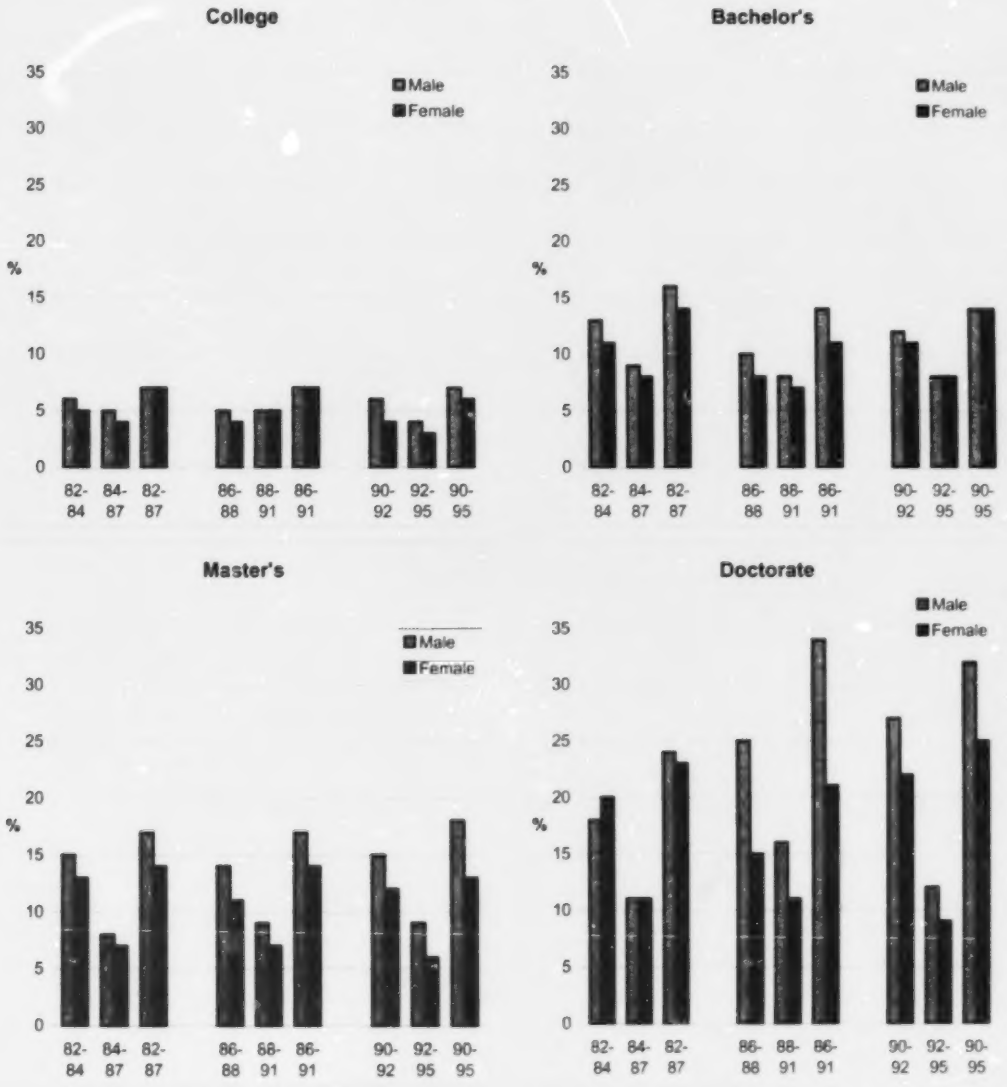
Probably the most striking aspect of the results is the large differences in the rates of inter-provincial mobility by level of education. Just 6 or 7 percent of the College graduates moved in the five years following graduation, rates varied from 11 to 18 percent amongst the Bachelor's and Master's level graduates, while between 21 and 34 percent of the Ph.D. level graduates changed their province of residence (the rates varying by sex and particular cohort). The rates at the highest degree level were, therefore, 3 to 5 times greater than those at the lowest level.

[40] A more detailed analysis would, of course, be required to see if these turnover patterns held once other factors were taken into account. As for the hypothesized negative relationship between turnover and wages, other theoretical models (*e.g.*, certain job search models) could predict the opposite. Analysing turnover patterns more extensively and assessing the wage-turnover relationship in the context of various competing theoretical models are, however, tasks which clearly lie beyond the scope of this study.

Table 24: Percentage Who Migrated Between Provinces

	Graduation to 1st Interview (%)	1st Interview to 2nd Interview (%)	Graduation to 2nd Interview (%)
1982			
All:			
Male	11	7	13
Female	9	7	11
COLLEGE:			
Male	6	5	7
Female	5	4	7
BACHELOR'S:			
Male	13	9	16
Female	11	8	14
MASTER'S:			
Male	15	8	17
Female	13	7	14
DOCTORATE:			
Male	18	11	24
Female	20	11	23
1986			
All:			
Male	9	7	12
Female	7	7	10
COLLEGE:			
Male	5	5	7
Female	4	5	7
BACHELOR'S:			
Male	10	8	14
Female	8	7	11
MASTER'S:			
Male	14	9	17
Female	11	7	14
DOCTORATE:			
Male	25	16	34
Female	15	11	21
1990			
All:			
Male	11	7	13
Female	9	6	11
COLLEGE:			
Male	6	4	7
Female	4	3	6
BACHELOR'S:			
Male	12	8	14
Female	11	8	14
MASTER'S:			
Male	15	9	18
Female	12	6	13
DOCTORATE:			
Male	27	12	32
Female	22	9	25

Figure 12: Percentage Who Migrated Between Provinces



These patterns presumably reflect the geographical extent of the relevant labour sub-markets corresponding to level of education – with College graduates clearly in more local markets, Ph.D. graduates operating at the national level to a much greater degree, and Bachelor's and Master's graduates lying between these others. While the general nature of these patterns might have been predicted, the specific magnitudes are interesting.[41]

[41] Finnie [1998] reports results which are consistent with these in a study of inter-provincial mobility amongst all Canadian adults (aged 20-55) using longitudinal samples constructed from individuals' tax records. Although education measures are missing from those data, inter-provincial mobility was found to be more common amongst

The results are also relevant to considerations of the costs and benefits of post-secondary education in Canada. In a context where education is exclusively a provincial jurisdiction (although partially supported by block grants from the federal government), the mobility rates shown above indicate that significant numbers of graduates have been leaving the provinces that have financed their schooling – with the positive relationship between mobility and the level of education meaning that it has been those individuals in which the greatest investments have been made which have been leaving at the greatest rates.[42]

That said, the fact that a substantial number of post-secondary graduates have been moving from one province to another is hardly surprising, and such mobility is of course generally desirable in terms of economic efficiency and the other benefits (economic, cultural, social, political) which result when young people move across the country. Furthermore, if the inter-provincial flows have more or less evened out – with a province's losses generally made up by entrants from elsewhere – then there might not be any serious problem with respect to the financing of post-secondary education, as what is lost at one end (the outflows) would be made up at the other (inflows).

If, on the other hand, the flows have been in any way asymmetric across the provinces, this would represent a situation where there were net winner and loser provinces in terms of who has been paying for the post-secondary training of the nation's youth and who has been benefiting from those investments, with important implications for the fairness and efficiency of post-secondary education in the country. Inter-provincial migration of graduates is, therefore, worthy of much further study, and the NGS databases would be an excellent vehicle for such investigations.[43]

As for other specific patterns, there was generally more mobility over the two years between graduation and the first interview than over the following three years, thus indicating a situation of declining marginal mobility over time. This is not surprising, since many graduates are likely

individuals at higher income levels – at least in the case of men – consistent with the mobility-education relationship found here.

[42] Of course many graduate students undertake their advanced studies in provinces other than where they completed their first degrees, meaning that the total investments in Master's and Ph.D. graduates are often shared by at least two provinces – with the associated losses thus similarly divided.

[43] Burbidge and Finnie [1999] focus on this issue.

to move at the precise point of graduation, while mobility would presumably diminish as more satisfactory jobs were found, the preferred province was moved to, personal roots became established, and so on.

With respect to the patterns by gender, male graduates have generally been somewhat more mobile than female graduates, presumably for a number of economic and non-economic reasons. For example, any greater general attachment to the labour market and career orientation on the part of men would presumably cause them to move more often in response to employment opportunities in other provinces, while the "psychological costs" of moving might also be smaller.

Finally, there are no obvious trends across cohorts – no general increases or decreases in the rates of inter-provincial mobility across the three cohorts, seen best in the cumulative totals for each group of graduates. This might be a somewhat surprising finding for some, coming as it does in a context where increased mobility of all sorts seems to be taken as a matter of fact and after having seen above that employment mobility (in the sense of changes of employer) did perhaps increase from the second cohort to the third cohort. The exception to this rule is the case of Ph.D. graduates, for whom mobility did rise over time – again perhaps at least partly reflecting the virtual shutdown in permanent hiring at colleges and universities, thus increasing the itinerant component of the professoriat.

4. Conclusion

4.1 Summary of the Principal Findings

This paper has presented the findings of a multi-faceted empirical analysis of the school-to-work transition of post-secondary graduates in Canada in the 1980s and 1990s based on the National Graduates Surveys, representing those who completed their studies in 1982, 1986, and 1990, each group interviewed twice, two and five years following graduation.

The principal goal of the paper has been to exploit the longitudinal aspect of the NGS data and the interesting mix of variables available on the files to analyse the evolution of a variety outcomes in the years following graduation at the aggregate level, and to study the individual level dynamics which can be observed from the first interview to the second. Comparisons have been made by gender and specific level of education (College, Bachelor's, Master's, Ph.D.), allowing us to gain insights into the different nature of the school-to-work transition along these dimensions. Finally, considerable attention has been paid to the cross-cohort comparisons facilitated by the availability of data for three separate cohorts, with the prime objective being to see if outcomes had worsened for later graduates, as would seem to be generally believed.

The first general finding is that the school-to-work transition is clearly an extended process, with many outcomes changing significantly from two to five years following graduation. Any assessment of "how graduates are doing" must, therefore, be interpreted in this dynamic context. For example: unemployment rates were already reasonably low as of two years following graduation, but declined further still in the following three years, with most of the unemployed finding jobs and the great majority of these being full-time positions; the proportion of workers in temporary jobs generally declined precipitously over the same interval and the rates of multiple job holding also dropped, as individuals presumably found positions which met their needs and wants; mean earnings generally rose substantially, with overall increases having varied between 11 and 23 percent, and ranging as high as 26 percent over the relevant three year period for male Bachelor's graduates of the first cohort; and so on.

On the other hand, there are other outcomes which did not change nearly as much and outcomes which changed in the "wrong" direction in the years following graduation. For example, women's rates of part-time work actually tended to rise, not fall from the first interview to the

second; the job-education skill match and the correspondence of graduates' jobs to their educational qualifications show mixed patterns; overall job satisfaction did not increase commensurately with the improvements in the more objective outcomes such as earnings, the movement from temporary to permanent jobs, *etc.*; and the overall evaluation of the education program in many cases fell.

As for the patterns by gender, many of the outcomes differ for men and women, typically in the expected directions, such as women having higher rates of part-time work and lower earnings than men, and the gender earnings gap widening over the two- to five-year interview interval. On the other hand, some of the more important gender differences narrowed considerably from the first cohort to the third, including a steady, significant narrowing in the earnings gap between male and female graduates at all levels.

The cross-cohort comparisons have focused principally on the first and third sets of graduates, observed at roughly comparable points in the business cycle (thus implicitly controlling for such influences). The most important general result is that the school-to-work transition did not change a great deal in any general way across cohorts – neither in terms of the outcomes as of the two points in time corresponding to the interview dates, nor in terms of the individual level dynamics observed across these two points in time. For example, that unemployment rates were uniformly about the same for the first and last cohorts, and that those graduates who were unemployed as of the first interview subsequently found jobs at about the same (high) rates represent powerful and important findings, while the nature of the jobs held – as measured along the variety of dimensions covered – has remained relatively stable as well.

That said, certain somewhat more subtle changes do appear to have occurred. For example, in most cases the mean earnings levels of male graduates fell from the first cohort to the third, by as much as almost 7 percent for Bachelor's graduates as of the five year mark. This was not, on the other hand, the case for women, for whom earnings were generally higher in each succeeding cohort, and in some cases fairly significantly so – with gains as great as 8 percent at the College and Ph.D. levels (hence the narrowing of the earnings gaps).

Outcomes thus deteriorated for one set of graduates, but improved for another, and such mixed patterns were more the rule than any sort of generalised declines. The cases where more uniform

changes were observed involved a rather limited number of outcomes, were typically relatively minor in degree, and were almost entirely restricted to the second interview outcomes and/or the change in individual level dynamics between the two interviews. These included slightly lower probabilities of moving from temporary to permanent jobs, smaller increases in earnings (probably the most significant change), and greater job turnover.

The cross-cohort changes thus varied from positive, to non-existent, through slightly adverse, to – at the worst – "moderate declines". And moderate declines – *at worse* – is probably much better than the wholesale declines that many might have expected.

4.2 Implications and Caveats

The main implications stem from the major findings that i) the school-to-work transition of post-secondary graduates is a process which continues to evolve for a good number of years following graduation, ii) the outcomes of all three cohorts have been relatively favourable, including significant improvements from the first interview (two years following graduation) to the second (five years out), and iii) although there were some small to moderate changes in certain outcomes, there was no significant general deterioration in graduates' outcomes over time.

At a time when there are many calls for measures to improve the employment opportunities of younger workers, these results have direct policy implications. The "youth unemployment problem" would, for example, not seem to have existed on any widespread scale for recent cohorts of post-secondary graduates, presumably obviating the need for action and allowing policy makers to focus their attention (and resources) on those truly in need of assistance – such as younger workers with less than post-secondary schooling. The same applies to the other aspects of the early labour market outcomes of graduates – they have really been doing rather well, and widespread policy measures have, therefore, probably not been warranted.

Other policy initiatives driven somewhat more indirectly by the assumption that the employment opportunities, incomes, and other labour market outcomes of post-secondary graduates have declined should be placed in similar context. For example, while great questions regarding the financing of post-secondary education and the ancillary discussions pertaining to the student loan system probably need to be entertained, the evidence presented here suggests they should not be

framed by an assumption that graduates' careers have taken a significant turn for the worse over the last decade or so.

This said, several caveats are worth mentioning. First, it remains possible that the situation has in fact changed for even more recent graduates than those studied here. On the other hand, surely the conditions about which most people talk – the changes in labour market structures and associated outcomes – would have affected at least the class of 1990 covered in these data, a group of graduates which entered the labour market in the midst of the early 1990s recession and which was interviewed as recently as 1995 for the second time. Yet the data show that most of the outcomes for this group were not generally very different from those of the cohort which finished their schooling almost a decade previously.

A second caution pertains to the fact that the data – and analysis – are longitudinal in only a limited sense, being based on information gathered at just two specific points in time, whereas it would obviously be desirable to track individuals more continuously and to construct more detailed profiles of the post-graduation record. Nevertheless, the broad outcomes which the data reveal would be unlikely to change very much with a more continuous analysis. For example, the relatively low unemployment rates found as of the two interview dates should be representative of the post-graduation situation more generally, while the low rates of repeated unemployment as of those same two points in time are at least a good indicator that chronic continuous unemployment has been quite rare – even as it must be acknowledged that an analysis across other selected points might have yielded somewhat different findings and that certain individuals might have had repeated spells which added up to large amounts of time without a job.

Third, although unemployment rates have generally been low and a large proportion of those who have been unemployed or in part-time or temporary jobs as of the first interview have found work and moved into permanent positions as of the second, such individuals might have had lower earnings or experienced other "scarring" effects – possibly long-term – stemming from these or any other initial disadvantages, especially with those troubles coming at such a critical early point in the career. Thus, although graduates have been generally doing well and large-scale policy measures would not appear to have been necessary, selective and specific interventions could still be warranted if these resulted in certain graduates getting on their feet more quickly,

with potentially large benefits accruing over graduates' lifetimes from such early "preventative" actions.

Finally, the changes that have been observed are in some cases not insignificant, might be the harbinger of further change to come, and should, therefore, not be ignored. For example, earnings profiles essentially became lower and flatter for some of the most recent groups of male graduates, and these shifts could lead to significant differences in life-time earnings for more recent graduates, while perhaps reflecting certain underlying tendencies – possibly powerful, possibly building stronger – which might augur ill for this particular cohort in later years and point to more seriously disadvantaged situations for other cohorts in the years to come.

In short, while the reality might be rather far from any notion that the bottom has fallen out for post-secondary graduates along with other younger workers, this does not mean that complacency should be the order of the day. And while it would appear that no drastic action has been required to date, this does not necessarily mean that nothing will be required in the future either. We are, in short, reduced to assessing what should be done now and in the future based on what has been happening in the past – the infamous "rear view mirror" perspective. Due to the simple fact of life that it takes time to collect, clean, and analyse data, such a delay is inevitable – and should simply spur us to take advantage of any new data as they become available – including future waves of the NGS.

4.3 Avenues for Further Research

Future research could go in a great many directions. Just two are mentioned here.

It would, first of all, be interesting to explore almost any of the outcomes covered here in greater detail, including the application of econometric models, with all of their associated advantages in terms of being able study various influences at the same time, the framework they provide for conducting hypothesis tests, including more formal testing of theoretical propositions, and so on.

Second, it would be similarly useful to address any number of the dynamic elements covered here more extensively, including the analysis of the incidence of various dynamic pathways, the effects of the first period situations on subsequent outcomes, and so on – including, again, the use of econometric models.

Appendix A

Variables Used in the Analysis

This Appendix provides detailed documentation of the construction of the variables used in the analysis, including discussion of the comparability of the measures across survey years. In keeping with the primary "dynamics" theme of this paper, the measures have been constructed (or otherwise manipulated by the author) so as to be as directly comparable across the two survey years for each cohort, even if this means that in some cases they are somewhat less directly comparable from one cohort to another. It should also be noted that a number of the measures depart from those derived by Statistics Canada which are directly available in the NGS databases, with such customizations driven by the needs of this specific analysis.

A.1 Further Studies

New Diploma

Essentially all formal post-secondary degree/certificate/diploma programmes were considered in the sample selection criterion whereby individuals who obtained an additional degree following graduation in 1982, 1986, or 1990 were deleted from the analysis. Exceptions include the following: "interest"/recreation-type courses, which typically do not represent any sort of formal human capital investment and which should not generally have a direct effect on early labour market outcomes; banking and insurance certificates, which are normally gained largely as a matter of a course by those on certain career paths; non-professional health certificates which, by their very designation, are not generally career related; high school diplomas, which were deemed to largely represent an accreditation formality without direct effects on labour market outcomes for those already possessing post-secondary diplomas; and registered apprenticeships, which were again seen to be part of a normal career path rather than additional formal schooling *per se*.

For the initial analysis on the distribution of new "proper" degrees obtained since graduation (before such individuals were deleted from the rest of the analysis), the categorisation into College, Bachelor's, Master's, and Ph.D. diplomas is straightforward.

Post-Graduation Combinations of Work and Study

The post-graduation patterns of work and study reported in Appendix B are based on individuals' enrolment and labour force status (part-time versus full-time in each case) for January and October in the year following graduation, conforming to the information available for all three sets of graduates. The measures generally conform standard Statistics Canada definitions. As mentioned in the text, enrolment information was not gathered for the interview dates themselves in any year except 1984.

A.2 Employment Status

Labour Force Status

The labour force classifications used here generally follow standard Statistics Canada definitions. The one exception is with respect to on-going students. Normally, part-time students looking for work are counted as being unemployed while full-time students are not, as they are deemed to not be "ready for work" due to their full-time student status. Here, however, full-time students looking for work are included with the other unemployed, since enrolment status as of the interview dates is missing from most years of the NGS data, thus precluding the usual treatment of full-time students. The resulting unemployment rates are, therefore, slightly biased upwards relative to what would be obtained with the more conventional definition.

With respect to the more detailed work study combinations presented in the last part of Appendix B (including the classification of non-labour force individuals according to current enrolment status), individuals were first categorised according to their labour force activity (*e.g.*, those combining work and school were classified with respect to the former rather than the latter), while those not in the labour force were then classified as enrolled or not enrolled based on the reason they gave for being out of the labour force. This may result in an underestimate of the number of non-labour force individuals actually in school, but should correctly identify those individuals who were not in the labour force because they were in school.

Part-Time Employment

Part-time jobs are defined as those at which the individual worked less than thirty hours per week – a standard definition.

The categorisation of individuals into voluntary versus involuntary part-time workers is based on a specific question to this effect, with the responses classified by the author as follows: *voluntary*: personal/family reasons, school, didn't want a full-time job; *involuntary*: could only find a part-time job, business conditions, contract work, shortage of work. Individuals who responded "illness/disability", "full-time job less than 30 hours", "other reason", or "multiple jobs" were excluded from the calculations on the grounds that such responses could not be safely considered as either voluntary or involuntary.

The response options are, however, not perfectly consistent across all surveys. In 1984, 1987, 1988, and 1991, they were identical, consisting of the three voluntary categories listed above, a single "could only find a part-time job" involuntary category, and the first three of the non-classified responses. In 1992, however, the "illness/disability" and "full-time job less than 30 hours" non-classified categories were not included. In 1995, the seven original response categories were again included, but the final three involuntary options listed above ("business conditions", "contract work", "shortage of work") were also available, as was the final non-classified category ("multiple jobs").

The results should, therefore, be directly comparable for the first four survey years (1984/87, 1988/91). The 1992 results are, however, only directly comparable to these others to the degree individuals who would have chosen one of the missing categories in that year ("illness/disability"

and "full-time job less than 30 hours") chose "other" instead, as this would make the aggregate of the "voluntary" responses comparable to those in the earlier periods. The 1995 results are comparable to the earlier periods to the degree that individuals who chose one of the additional "involuntary" responses ("business conditions", "contract work", "shortage of work") would have responded "could only find a part-time job" in the earlier years, and if individuals who chose the "missing jobs" response would have given one of the non-classifiable reasons in an earlier survey (presumably the "other" category).

In summary, the results are directly comparable for the first four surveys, and it would seem reasonable on logical grounds to assume that the results for the later two periods are also quite comparable to the those of the earlier periods (and each other), but this cannot be verified empirically, leaving a margin of uncertainty in this regard.

Permanent Versus Temporary Job

Based on a direct question to this effect: "Is this [the current (main) job] a temporary or permanent position?" (In 1984, the question was slightly different: "Did you have a permanent position?", but the responses should be very comparable). There is, however, a slight problem with this variable in the 1987 data. Specifically, individuals who had worked continually with the same employer since the first interview (1984) were not asked the question, and were simply imputed to have been in a permanent job, whereas some individuals could have been in temporary jobs the whole time. The calculations for 1987 therefore undercount the number of temporary jobs and are not directly comparable to the results in other years.

The reason the person was in a temporary job, available only in the 1992 data, is based on a direct question to this effect, with the categories shown in the tables corresponding to the available response options.

Paid Versus Self-Employed Worker

Based on a direct question regarding the class of worker, with the options being paid worker, self-employed, and "other" (including family workers, volunteer work, *etc.*), with workers of the latter type deleted from most of the analysis (as discussed in the text). Note that "self-employed" represents a relatively diverse group, including individuals working under contract for others ("independent professionals"), those with their own companies ("entrepreneurs"), and so on.

Multiple Jobs

Based on direct questions to this effect: "Did you have more than one job or business last week?"

A.3 Job Characteristics/Outcomes and Other Evaluative Measures

Earnings

Based on the question: "Working your usual number of hours, approximately what would be your annual earnings before taxes and deductions at that job?" The variable thus represents what the person would earn on an annual basis were the job to last the full year, regardless of the actual job status. In adjusting for irregular work patterns in this manner, the measure represents the

individual's rate of pay as measured on an annual basis, rather than the amount necessarily earned. It is a somewhat unconventional measure, but well-defined, analytically interesting, and presumably well reported (being a figure individuals either know, or should be able to calculate rather easily). All earnings values are expressed in constant 1995 dollars, rounded to the nearest thousand, and capped at the $99,000 upper limit which characterises the 1984 data (the lowest bound in the six databases), or $143,035 in constant 1995 dollars (see Finnie [1999a] for further discussion of the capping issue in the context of making earnings comparisons across surveys.)

The Job-Education Skill Match

Based on the question: "Do you use any of the skills acquired through the education programme completed in [year] [in your job]?" For the 1982 and 1986 cohorts, the response options were "yes" and "no"; for the 1990 cohort, the response options were "to a great extent", "to some extent", "very little", "not at all". The responses were then ordered on a scale running from 0 to 100, with higher scores indicating a closer job-education skill match. Thus, the 1982 and 1986 cohort scores were assigned either 0 ("no") or 100 ("yes"), while the 1990 scores range from 0 ("not at all"), to 33 1/3 ("very little"), through 66 2/3 ("to some extent"), to 100 ("to a great extent").

The tables report the mean values of these scores, thus transforming the series of categorical responses to a simple scalar measure. See the last part of this appendix for further discussion of these transformations. Given the underlying response options, the scores should be generally comparable across education levels and interview years (two and five years after graduation) for a given cohort, and also comparable between the 1982 and 1986 cohorts, but not directly comparable across the first two cohorts and the last cohort.

The measure used here departs from the derived variable available directly in the NGS databases, as the latter also depends on a question as to whether the individual's discipline was one which was intended to produce directly relevant job skills. The variable used here might, therefore, be thought of as being a "purer" measure of the actual job-education skill match which does not confound the effects of graduates' opinions of the intention of the programme with the actual job-education skill relationship.

Job Satisfaction

Based on the question: "Considering all aspects of your job, how satisfied are you with it?" The response options were similar in all years: "very satisfied", "satisfied", "dissatisfied", "very dissatisfied" in the 1986 and 1990 survey years (1988/91 and 1992/95); and the last two options differing very slightly for the first cohort: "not satisfied", "not at all satisfied". The scores should, therefore, be directly comparable across all surveys. The responses were then ordered on a scale running from 0 to 100 similar to the job-education skill match measure, with higher scores indicating greater job satisfaction. See the last part of this appendix for further discussion of these transformations.

Educational Prerequisites of the Current Job

Based on the question: "When you were hired…what were the minimum educational qualifications required?" The over/under/even-qualified measures were then created by comparing the response with the level of the programme completed in the graduation year – with the more detailed categories in the post-1984 years reduced to the broader "College", "Bachelor's", Master's", and Ph.D." categories in order to focus on more significant differences and to have a consistent measure across surveys. With the similar questions and this transformation, the scores should be comparable across all years.

This measure is different from the one of a similar nature derived by Statistics Canada, constructed by comparing the required level with either, in the case of the two-year surveys (1984, 1988, 1992) the highest level of education or, in the case of the five-year follow-ups (1987, 1991, 1995) the level of the programme from which the individual graduated in the base year (the latter being used in the constructions used in the present analysis, as just described). The resulting calculations would, therefore, be comparable across all three cohorts for a given interview year (two or five years after graduation), but not across interview years for a given cohort (*i.e.*, from two to five years following graduation) due to differences between the highest level of education and that which the individual obtained in the graduation year in question (including individuals who had returned to school to obtain a "lower" degree).

Overall Evaluation of the Education Programme

For the 1982 and 1986 cohorts, based on the question: "Given your experience since completing the requirements for the diploma/degree [graduated from in the indicated year], would you have selected the same educational program, a different program, or not taken any post-secondary program?" with the permitted responses being: "Would choose the same programme," "Would choose a different programme," and "Would choose no programme." For the 1990 cohort, based on the question: "Given your experience would you have taken the same field of study or specialization?" with the permitted responses being "Yes" or "No".

These different treatments are driven by the differences in the information available across the different surveys. In some cases the actual questions were different, while in other cases their ordering was different from one survey from the other, meaning that even where similar variables exist for different years, it is not certain that the responses are directly comparable. For example, the only question asked in 1995 enquired as to the specific field of study; the field question was asked in parallel to another regarding the level of the programme (College, Bachelor's, *etc.*) in 1992; and the 1984, 1987, 1988, and 1991 surveys all led with a more general question regarding "the programme" and then followed with more specific questions pertaining to the kind or level of the programme and then the specific field, except in 1984, when the field question was not asked at all.

In keeping with the "dynamics" theme of this paper, consistency across the two survey years for each cohort was maintained by using the broader "programme" question for the first two cohorts and the narrower "field" question for the last cohort. The results should, therefore, be directly comparable across the two interview years for a given cohort, and probably very closely

comparable across the first two cohorts, but not directly comparable between the first two cohorts and the third.

The responses were then ordered on a scale running from 0 to 100, with a value of 100 going to those who indicated they would choose the same programme (1982 and 1986 surveys) or the same field (1990 surveys), and a value of 0 where another field or programme (or no programme – a very rare response) would have been chosen. This resulted in a scalar measure where higher scores indicate greater satisfaction with the educational programme/field. (The evaluation scores should tend to be generally higher for the last cohort because the underlying question – restricted to the choice of field, as opposed to "the programme" – was narrower.) See the last part of this appendix for further discussion of these transformations.

A.4 Job and Geographical Mobility

Change of (Main) Employer

The variable was constructed from various questions regarding the continuity of employment from the first interview to the second and the relevant employer(s). For example, if the individual was continuously employed with the same employer in each period and in each case that employer was the main one, then the person clearly did not change (main) employers and was classed as such. Other cases were, however, more complicated, and thus required more sophisticated checks. For example, in cases where the individual was with the same (main) employer in both interviews but did not work continuously with that employer over the entire interval, employment records were bridged across the relevant breaks so that the individual was classified as having been with the same employer in both periods. On the other hand, there were other cases where the individual was with the same employer in both periods but the *main* employer had changed.

Over all, the variables available in the NGS surveys facilitated the comprehensive identification of a change in main employer in a consistent fashion across all surveys. There is, however, one exception to this rule. In the 1986 and 1990 cohorts, it could not be ascertained if individuals who were i) multiple job holders as of the second interview and ii) had not worked continuously for the same main employer since the first interview had changed main employer. There are, however, fewer than 100 such individuals in each cohort and there is no reason to believe this results in any significant bias.

Inter-Provincial Migration

This measure is defined in a straight-forward fashion, representing a move from one province to another i) between graduation and the first interview, ii) between the two interviews, iii) either one or the other ("ever move"). The results presented are based on all graduates who responded to the two surveys (*i.e.*, with no additional degree, labour market, or other restrictions).

A.5 Further Notes on the Index Variables and the Related Standard Deviations

Each of the index constructions mentioned above – regarding the job-education skill match, job satisfaction, and overall evaluation of the educational programme – may be thought of as being based upon a more fundamental set of evaluations representing the job-education skill match, job satisfaction, or overall evaluation of the educational programme. The data collection process and the construction of the indexes described above thus consist of first reducing those more underlying evaluations to a series of discrete choices (the original response options reported in the NGS databases) and then transforming these categorical responses into the indexes whose mean scores are reported in the tables. Higher values thus indicate a closer job-education skill match, greater satisfaction, etc.

In short, the original response variables given in the NGS data are reduced to a much more convenient scalar measure which can be thought of as representing an index of the underlying evaluations, for which mean values can be easily constructed. The constructed indexes and the associated means have the distinct advantage of significantly reducing the dimensionality of the underlying evaluations and thereby facilitating comparisons across groups and over time relative any exercise based on the full set of categorical responses.

An analogy in the econometric literature is the general approach underlying the well-known dichotomous response models such as the probit, logit, and tobit. In these cases, there is assumed to be an unobservable underlying index variable which gives rise to the measured responses once certain thresholds are passed (*e.g.*, individuals enter the labour market when the market wage they face is greater than their (unobserved) reservation wage). In the present case, we may think of an underlying job-education skill match variable giving rise to the observed distribution of discrete responses included in the NGS databases as the underlying thresholds are passed. The conversion of these results to the 0-100 scales described above may, therefore, be seen as generating an index which represents the average levels of the more fundamental scores, with higher levels representing closer job-education skill matches or greater satisfaction.

The standard errors of these mean index scores which are reported are not exactly correct, since they assume normality, whereas the relevant index scores are actually distributed in a discrete fashion (*e.g.* 0, .33, .67, 100). They are, however, much easier to calculate, and should provide good approximations of the actual reliability of the measures. In practice, most of the calculated standard errors are quite small, suggesting that the majority of the observed differences are likely to be statistically significant.

In previous work, the full sets of categorical responses were reported and complex-squared tests based on the underlying properties of the discrete distributions represented by the responses included in the NGS databases were used to test for differences across groups (Finnie [1996]). The present approach has been developed since that time as a better means of summarising the relevant information.

Appendix B

Post-Graduation Patterns of Work and Study

Table B1: Work/Study Combinations

	Not Enr %	Enr /NLF %	Enr /in LF %	Not Enr %	Enr /NLF %	Enr /in LF %
1982		January 1983			October 1983	
ALL:						
Male	67	15	18	69	13	18
Female	72	12	16	74	9	17
COLLEGE:						
Male	77	10	13	79	7	13
Female	82	7	11	81	6	13
BACHELOR'S:						
Male	60	18	21	63	16	21
Female	65	15	20	69	11	20
MASTER'S:						
Male	70	12	17	71	12	18
Female	75	9	15	75	9	16
DOCTORATE:						
Male	90	4	6	90	4	6
Female	89	5	6	91	5	4
1986		January 1987			October 1987	
ALL:						
Male	70	12	17	72	10	18
Female	72	10	19	73	8	20
COLLEGE:						
Male	79	8	13	81	6	13
Female	82	5	13	81	4	15
BACHELOR'S:						
Male	64	15	20	66	12	22
Female	64	12	23	67	10	23
MASTER'S:						
Male	74	11	15	74	10	16
Female	79	8	13	77	7	16
DOCTORATE:						
Male	94	2	3	94	2	5
Female	92	3	5	92	2	6
1990		January 1991			October 1991	
ALL:						
Male	78	12	10	82	10	7
Female	80	10	10	84	9	8
COLLEGE:						
Male	85	7	8	89	5	6
Female	88	6	7	89	5	6
BACHELOR'S:						
Male	73	15	12	78	13	9
Female	75	13	12	80	12	9
MASTER'S:						
Male	80	12	7	82	12	6
Female	86	7	7	87	7	7
DOCTORATE:						
Male	96	3	1	97	2	1
Female	96	3	1	97	3	0

Table B2: Detailed Work/Study Combinations

1982 Cohort

	Not Enr. %	Enr. PT/NLF %	Enr. PT/Unemp. %	Enr. PT/Work PT %	Enr. PT/Work FT %	Enr. FT/NLF %	Enr. FT/Unemp. %	Enr. FT/Work PT %	Enr. FT/Work FT %
January 1983									
ALL:									
Male	67	0	1	1	8	14	1	5	2
Female	72	1	1	2	7	11	1	4	1
COLLEGE:									
Male	77	0	1	1	6	10	1	3	1
Female	82	0	1	2	5	7	1	2	0
BACHELOR'S:									
Male	61	0	2	1	8	18	1	6	3
Female	65	1	1	3	8	14	1	5	2
MASTER'S:									
Male	70	0	1	1	10	12	1	4	2
Female	75	1	1	1	9	9	0	3	1
DOCTORATE:									
Male	90	0	0	0	3	4	1	1	2
Female	89	-	-	-	-	-	-	-	-
October 1983									
ALL:									
Male	70	0	1	1	9	12	1	4	2
Female	74	1	1	2	9	8	1	3	1
COLLEGE:									
Male	80	0	1	1	7	7	1	2	1
Female	82	0	1	2	7	5	0	2	0
BACHELOR'S:									
Male	63	0	1	1	10	15	1	5	3
Female	69	1	1	2	10	10	1	4	1
MASTER'S:									
Male	71	0	1	0	10	12	1	4	1
Female	75	1	0	1	9	8	0	3	1
DOCTORATE:									
Male	91	0	0	0	3	4	0	0	1
Female	91	-	-	-	-	-	-	-	-

Continued

Table B2 *(Cont.)*

1986 Cohort

	Not Enr. %	Enr. PT/NLF %	Enr. PT/Unemp. %	Enr. PT/Work PT %	Enr. PT/Work FT %	Enr. FT/NLF %	Enr. FT/Unemp. %	Enr. FT/Work PT %	Enr. FT/Work FT %
January 1987									
ALL:									
Male	71	0	0	1	9	12	0	5	2
Female	72	0	0	2	10	9	0	5	1
COLLEGE:									
Male	79	0	0	1	8	7	0	3	1
Female	82	0	0	1	7	5	0	3	0
BACHELOR'S:									
Male	64	0	0	1	10	15	1	6	3
Female	65	1	0	3	12	12	0	6	2
MASTER'S:									
Male	74	0	0	1	7	11	0	5	2
Female	79	0	0	1	7	7	0	4	1
DOCTORATE:									
Male	94	0	0	0	1	2	0	1	0
Female	92	0	0	0	3	3	0	1	1
October 1987									
ALL:									
Male	72	0	1	1	10	10	0	4	2
Female	73	0	1	2	11	7	0	4	1
COLLEGE:									
Male	81	0	0	1	8	6	0	3	1
Female	81	0	0	1	10	4	0	3	0
BACHELOR'S:									
Male	66	0	1	1	11	12	0	5	3
Female	67	1	1	3	12	9	0	5	1
MASTER'S:									
Male	74	0	0	1	7	10	1	5	2
Female	77	0	0	1	8	7	0	5	1
DOCTORATE:									
Male	94	0	0	0	2	2	0	1	1
Female	92	0	0	0	3	2	0	1	1

Continued...

Table B2 *(Cont.)*

1990 Cohort

	Not Enr. %	Enr. PT/NLF %	Enr. PT/Unemp. %	Enr. PT/Work PT %	Enr. PT/Work FT %	Enr. FT/NLF %	Enr. FT/Unemp. %	Enr. FT/Work PT %	Enr. FT/Work FT %
January 1991									
ALL:									
Male	79	0	1	1	2	11	1	4	1
Female	81	0	1	1	2	9	0	4	1
COLLEGE:									
Male	86	0	1	1	2	6	0	2	1
Female	88	0	0	1	2	6	0	2	0
BACHELOR'S:									
Male	74	1	1	1	2	14	1	5	1
Female	76	1	1	2	2	12	0	5	1
MASTER'S:									
Male	81	0	0	0	1	12	0	4	1
Female	86	0	0	1	2	7	0	3	1
DOCTORATE:									
Male	96	0	0	0	0	2	0	0	1
Female	96	0	0	0	0	3	0	0	0
October 1991									
ALL:									
Male	83	0	1	1	1	10	0	3	1
Female	85	1	1	1	2	8	0	3	0
COLLEGE:									
Male	90	0	1	0	1	5	0	1	0
Female	90	1	0	1	1	4	0	2	0
BACHELOR'S:									
Male	79	0	1	1	2	13	0	4	1
Female	81	1	1	1	2	11	0	3	0
MASTER'S:									
Male	83	0	0	0	1	12	0	4	0
Female	87	0	1	1	1	6	0	3	0
DOCTORATE:									
Male	97	0	0	0	0	2	0	0	0
Female	97	0	0	0	0	2	0	0	0

Table B3: Expanded Activity Rates (% Distribution)

	1st Interview					2nd Interview				
	Employed			NLF		Employed			NLF	
	Full	Part	Unemp.	Enrol.	Not Enr.	Full	Part	Unemp.	Enrol.	Not Enr.
1982										
All:										
Male	79	6	9	4	1	85	5	4	3	2
Female	72	12	9	3	4	74	13	4	3	6
COLLEGE:										
Male	82	5	10	1	1	85	4	6	3	2
Female	74	13	9	1	3	72	15	5	3	6
BACHELOR'S:										
Male	77	7	9	6	2	85	5	4	4	2
Female	71	12	9	4	4	75	12	4	3	6
MASTER'S:										
Male	82	4	5	7	1	87	6	2	3	2
Female	73	10	8	5	4	74	13	3	3	7
DOCTORATE:										
Male	87	4	6	2	1	90	5	3	1	1
Female	82	5	6	1	5	82	9	2	2	4
1986										
All:										
Male	81	5	9	4	1	85	4	7	3	1
Female	74	12	8	3	3	76	12	6	2	5
COLLEGE:										
Male	86	4	9	2	1	85	3	9	2	1
Female	79	10	6	1	3	76	11	6	2	5
BACHELOR'S:										
Male	78	5	10	5	2	85	4	6	4	1
Female	72	12	8	5	3	75	12	6	3	5
MASTER'S:										
Male	78	6	6	8	1	87	6	4	3	1
Female	73	11	7	6	3	76	15	4	3	3
DOCTORATE:										
Male	89	4	4	1	1	95	2	2	0	1
Female	79	10	8	2	2	85	10	3	0	2
1990										
All:										
Male	80	6	9	4	1	86	4	6	2	1
Female	72	13	9	3	3	75	13	6	2	5
COLLEGE:										
Male	82	6	10	1	1	86	5	7	1	1
Female	73	14	8	1	3	73	15	6	1	5
BACHELOR'S:										
Male	79	6	9	5	1	86	4	6	3	1
Female	70	13	10	3	4	76	12	5	2	4
MASTER'S:										
Male	79	7	5	8	1	84	5	6	3	1
Female	74	11	7	5	3	74	12	6	3	5
DOCTORATE:										
Male	91	3	4	1	1	93	3	4	0	0
Female	84	6	7	1	2	82	7	7	0	4

Note: Samples exclude those who did not respond to the second interview.

Table B4a: Expanded Activity Dynamics, All Graduates

1st Interview	1982 Cohort: 2nd Interview					1986 Cohort: 2nd Interview					1990 Cohort: 2nd Interview				
	Employed			NLF		Employed			NLF		Employed			NLF	
	Full	Part	Unemp.	Enrol.	Not Enr.	Full	Part	Unemp.	Enrol.	Not Enr.	Full	Part	Unemp.	Enrol.	Not Enr.
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
MALE															
Employed															
Full	90	3	3	2	2	90	2	5	2	1	92	3	4	1	0
Part	73	16	4	4	3	63	20	10	6	1	64	22	8	5	1
Unemp.	72	7	10	7	3	68	7	18	6	1	71	6	18	3	2
NLF															
Enrol.	58	11	6	19	7	58	11	10	20	1	54	8	16	20	2
Not Enr.	49	-	-	-	-	46	-	-	-	-	49	-	-	-	-
FEMALE															
Employed															
Full	83	9	3	2	4	83	8	4	1	3	84	8	4	1	3
Part	54	33	4	3	6	56	30	6	3	5	50	37	6	2	5
Unemp.	59	17	11	6	8	63	13	15	4	6	62	17	13	2	6
NLF															
Enrol.	46	20	5	19	10	56	20	13	9	2	50	14	12	18	6
Not Enr.	29	21	5	4	41	25	15	10	6	44	31	14	12	2	41

Note: Samples exclude those who did not respond to the second interview.

Table B4b: Expanded Activity Dynamics by Level of Education

College Graduates

1st Interview	1982 Cohort: 2nd Interview					1986 cohort: 2nd Interview					1990 Cohort: 2nd Interview				
	Employed			NLF		Employed			NLF		Employed			NLF	
	Full %	Part %	Unemp. %	Enrol. %	Not Enr. %	Full %	Part %	Unemp. %	Enrol. %	Not Enr. %	Full %	Part %	Unemp. %	Enrol. %	Not Enr. %
MALE															
Employed															
Full	88	3	5	3	2	89	2	7	1	1	91	3	5	1	1
Part	69	14	9	5	3	63	22	12	3	1	65	23	8	3	1
Unemp.	71	6	12	7	4	60	5	26	6	3	69	5	21	2	3
NLF															
Enrol.	65	-	-	-	-	71	-	-	-	-	-	-	-	-	-
Not Enr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEMALE															
Employed															
Full	80	10	4	2	3	82	8	5	1	4	82	10	4	1	3
Part	48	37	4	3	7	59	29	6	1	6	47	40	6	1	6
Unemp.	59	17	9	6	9	63	10	15	5	7	56	16	17	1	9
NLF															
Enrol.	-	-	-	-	-	64	-	-	-	-	57	-	-	-	-
Not Enr.	26	16	7	4	48	32	15	11	4	38	27	14	17	4	39

Bachelor's Graduates

1st Interview	1982 Cohort: 2nd Interview					1986 cohort: 2nd Interview					1990 Cohort: 2nd Interview				
	Employed			NLF		Employed			NLF		Employed			NLF	
	Full %	Part %	Unemp. %	Enrol. %	Not Enr. %	Full %	Part %	Unemp. %	Enrol. %	Not Enr. %	Full %	Part %	Unemp. %	Enrol. %	Not Enr. %
MALE															
Employed															
Full	90	3	3	2	2	91	2	5	2	0	92	3	4	2	0
Part	75	16	2	4	3	64	17	10	8	1	65	21	7	6	1
Unemp.	73	8	9	8	2	72	7	15	5	1	72	6	17	3	2
NLF															
Enrol.	58	9	46	20	6	58	9	10	22	1	53	8	14	23	1
Not Enr.	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEMALE															
Employed															
Full	84	8	2	2	4	83	8	4	2	3	85	7	4	1	3
Part	59	30	4	2	5	56	30	6	4	4	53	35	5	2	5
Unemp.	60	16	11	6	6	64	12	15	4	6	66	17	12	2	3
NLF															
Enrol.	48	19	5	19	9	56	20	14	8	2	51	14	10	18	6
Not Enr.	33	22	4	3	38	21	16	10	7	47	34	13	9	2	43

Continued...

Table B4b *(Cont.)*

Master's Graduates

1st Interview	1982 Cohort 2nd Interview					1986 Cohort 2nd Interview					1990 Cohort 2nd Interview				
	Employed			NLF		Employed			NLF		Employed			NLF	
	Full %	Part %	Unemp. %	Enrol. %	Not Enr. %	Full %	Part %	Unemp. %	Enrol. %	Not Enr. %	Full %	Part %	Unemp. %	Enrol. %	Not Enr. %
MALE															
Employed															
Full	93	3	1	1	1	93	2	3	1	0	93	2	3	1	1
Part	68	-	-	-	-	59	26	8	6	1	52	29	13	6	0
Unemp.	68	12	11	6	5	70	14	8	8	0	65	6	20	4	5
NLF															
Enrol.	50	20	4	20	7	49	19	10	20	2	44	12	22	21	2
Not Enr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEMALE															
Employed															
Full	86	6	2	1	4	86	9	2	2	2	86	7	4	1	2
Part	45	44	3	2	6	47	40	7	3	3	37	42	10	5	6
Unemp.	51	23	11	3	12	49	31	12	4	4	52	16	12	5	15
NLF															
Enrol.	33	-	-	-	-	47	24	11	15	3	37	12	18	27	6
Not Enr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Doctorates Graduates

1st Interview	1982 Cohort 2nd Interview					1986 cohort 2nd Interview					1990 Cohort 2nd Interview				
	Employed			NLF		Employed			NLF		Employed			NLF	
	Full %	Part %	Unemp. %	Enrol. %	Not Enr. %	Full %	Part %	Unemp. %	Enrol. %	Not Enr. %	Full %	Part %	Unemp. %	Enrol. %	Not Enr. %
MALE															
Employed															
Full	93	3	3	1	0	96	1	2	0	1	95	2	3	0	0
Part	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unemp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NLF															
Enrol.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Enr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEMALE															
Employed															
Full	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Part	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unemp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NLF															
Enrol.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Not Enr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: Samples exclude those who did not respond to the second interview.

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